THE CULTIVATOR:

A MONTHLY PUBLICATION, DEVOTED TO AGRICULTURE.

I KNOW OF NO PURSUIT IN WHICH MORE REAL AND IMPORTANT SERVICES CAN BE RENDERED TO ANY COUNTRY, THAN BY IMPROVING ITS AGRICULTURE.—*Wash.*

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THE CULTIVATOR.

TO IMPROVE THE SOIL AND THE MIND.

The New Husbandry.

IV. ALTERNATION OF CROPS.

Alternation of crops is an essential requisite in good farming, and forms a part of it wherever it is considered to have arrived at any degree of perfection. It is this which gave to Flemish husbandry a pre-eminence over that of every other country, long before the new system had obtained a footing in Great Britain. It is this which has principally converted the county of Norfolk, and other disticts in England, from the poorest and least productive, into the most wealthy and populous portions of that country. It is this alternating system which has contributed, in a great measure, to the astonishing recent improvements in the agriculture of Scotland; and it is this which constitutes the pioneer marks of improved husbandry in our own land.

In the preceding sections, we have suggested the importance and the modes of making our lands rich, and dry, and of subjecting them to good tillage. Let us now inquire under what method of management they are likely to make us the largest returns, without diminishing their intrinsic value.

It is palpable to every observing farmer, that the old mode of permanently dividing our grounds into meadow, plough and pasture lands—is a most wretched system of exhaustion, both to the land and its occupant. The tillage ground deteriorates, with the scanty manuring it gets, till it ceases to make a return for the expense of culture, or till it is thrown into old fields or commons. The meadow grasses run out, mosses and weeds come in, the soil becomes too compact and impervious for the ready admission of the great agents of vegetable decomposition and nutrition, and the free extension of the roots of the finer grasses;—and, as all is carried off, and little or nothing brought back, the soil is annually becoming poorer and less profitable. The pasture is the only portion of such a farm that is improving; and even in this bushes, brambles and noxious weeds are too often permitted to choke and destroy the better herbage.

It is equally apparent, that we cannot take two or more arable crops, of the same kind, from a field, in successive seasons, without a manifest falling off in the product. The reason of this may be found in an immutable law of nature, which has provided for each species of plants a specific food, suited to its organization and its wants. Thus some soils will not grow wheat, or other farm crops, although abounding in the common elements of fertility, and although they will make a profitable return in other farm crops,—in consequence of their being deficient in the specific food required for the perfection of the wheat, or other particular species of crop. One family, or species of plants, requires a different food from that which another family, or species, requires; and it seems to be another law of nature, that what is not essential to one family, or species, shall be left in the soil, or returned to it through the excretory organs of the growing crop. Of course, the specific food for any class, or species, continues to accumulate in the soil, the general fertility being kept up, till the return again to the field of this particular crop. Thus it is supposed to require ten or a dozen years for the specific food of flax, to accumulate sufficiently for a second crop, after one has been taken from a field. Even the specific food of clover becomes exhausted by a too frequent repetition of it in the same field: it being found necessary, in Norfolk husbandry, to substitute for it in every other course of crops, other grass seeds, so that this may not be repeated oftener than once in eight years. There are exceptions to the rules of practice which these laws inculcate. Some soils seem natural to wheat, others to oats, or grass; and successive crops of these are taken without apparent diminution of product. Yet it is better to regulate our practice by general laws, than by casual exceptions. In the cases noted as exceptions, there is probably so great an accumulation of the specific food of the particular crop, that it has not been *exhausted*, though it evidently must have been *diminished*. It is in accordance with the natural laws we have noticed, that the grasses in our meadows change; that the timber trees of the forest alternate—new species springing up as the old ones decay, or are cut down; and it is in accordance with these laws that the alternation of crops has been adopted in all good farming.

To simplify and render the subject more plain, the generality of tillage crops have been grouped into two classes, differing essentially in their character, culture, and exhausting influence upon the soil. These two classes are denominated *culmiferous* crops, and *leguminous* crops. The first is so named from *culm*, the stalk or stem of grains or grasses, usually jointed and hollow, and supporting the leaves and fructification. Our intention here is not to embrace the grasses. Culmiferous crops are termed robbers, or exhausters of the soil. This class includes wheat, barley, oats, rye, indian corn, tobacco, cotton, &c. These are particularly exhausting during the process of maturing their seeds. If cut green, or when in blossom, they are far less so. Leguminous crops, literally, are peas, beans, and other pulse; but here the class is intended to embrace all which are considered as ameliorating or enriching crops, as potatoes, turnips, carrots, beets, cabbages—and clover. These latter are not only less exhausting than the culmiferous class, as most of them do not mature their seeds, and all, on account of their broad system of leaves, draw more or less nourishment from the atmosphere, but they improve the condition of the soil, by dividing and loosening it, with their tap and bulbous roots. For these reasons they are called ameliorating or enriching crops; and as they generally receive manure, and drill culture, they are peculiarly adapted to enrich and fit the soil for the culmiferous class.

Good husbandry enjoins, that culmiferous and leguminous crops should alternate, or follow each other in succession, except when grass is made to intervene; and it matters little which crops are selected from the two classes. The good judgment of the farmer may here be exercised to determine which are likely to be to him the most advantageous. It may be proper to note two exceptions to this rule: Indian corn may, under certain contingencies, be made to precede or follow another grain crop to advantage, and oats may sometimes be profitably sown, as a fallow crop, to supersede a naked fallow, preparatory to a crop of wheat or rye. Some soils, it is true, are more favorable to one kind of crop than another; as for instance, calcareous clays and strong loams are better adapted to wheat, than silicious gravels and sands; while the latter are better fitted to carry Indian corn, turnips and clover, than clays. In other respects, such as the exhaustion of the ground, it is a matter of little interest with the farmer, what crops of each class are chosen to alternate with each other.

Farm stock seems necessarily to be embraced in the system of alternate husbandry. Cattle convert the bulky products of the farm, into meats, butter, cheese, &c. These concentrated products are carried to market at comparatively trifling expense. Cattle also furnish labor, and manufacture into manure the straw, stalks, and other offal and litter of the farm, necessary to keep up its fertility; for without manure, the soil will grow poor, and its products annually diminish. Manures, we repeat, are the main source of fertility to our soils, and the substantial food of our crops. Our supply of these will depend on the amount of stock we feed upon the farm; and the amount of stock we can keep profitably, will again depend upon the fertility of the soil, and the consequent abundance of its products. So that grain and grass husbandry, and cattle husbandry, are reciprocally and highly beneficial to each other. It is maintained, by practical men, that grounds under good tillage, will yield as much cattle food, in roots, straw, &c. as the same grounds would yield in grass, thus leaving the grain as extra profit.

The subject of clover, which we have classed with ameliorating crops, merits a further and distinct notice. We find that clover was cultivated at an early period by the Flemings, and constituted an important item in their excellent system of husbandry. Its introduction into Britian is of comparatively modern date. Forty years ago its culture may be said to have commenced in the United States; but its progress was slow till within the last few years; and even now, large portions of our country are practically ignorant of its improving and enriching qualities. Its benefits have been great wherever it has been introduced, accompanied with the use of gypsum; and the two combined have hitherto been the principal basis of good husbandry. But their benefits are capable of being far more widely extended. We consider the use of clover for cattle food, great as it is, but of secondary importance to the farmer—its most profitable use being to feed crops and ameliorate the soil. No green crop is so serviceable for the latter purposes; and we are satisfied from experience, that the practice of habitually sowing it with small grains, for these purposes, where it is not intended to stock with grass seeds, is an excellent one, on all grounds adapted to its growth. Upon this subject we quote as follows from Chaptal:

"Artificial grass lands [constituting a part of the alternating system, and in contradistinction to natural and permanent grass lands] ought now to be considered as forming the basis of agriculture. These furnish fodder, the fodder supports cattle, and the cattle furnish manure, labor, and all the means necessary to a thorough system of cultivation."

V. ROOT CULTURE.

The advantage of root culture to the soil, in the alternating system, has already been briefly alluded to; but this culture possesses higher claims to our notice than the bare influence it has in ameliorating the soil: It constitutes otherwise a valuable source of fertility to the farm, and of profit to the farmer. It trebles the amount of cattle food, and doubles the quantity of manure. Potatoes constitute a great portion of the bread and meat of the Irish peasantry, feed their cows, fatten their pigs and poultry, and form an article of foreign commerce. The turnip has long been made an important crop in German husbandry. The beet has become so important in France, as to engage the attention of her scientific men, and of the government, in extending its culture. The field culture of the carrot has long been profitably pursued among the Flemings. And as it regards Great Britain, whose example in husbandry is deservedly held up for our imitation, her best writers on rural matters, and her best practical farmers, all concur in saying, that her pre-eminent success in modern husbandry, has been in a great measure owing to the introduction of turnips as a field crop in that island. We will here quote a passage from the New Edinburgh Encyclopædia, in corroboration of what we say:

"The introduction of turnips into the husbandry of Britain, occasioned one of those revolutions in rural art which are constantly occurring among husbandmen, and, though the revolution came on with slow and gradual steps, yet it may now be viewed as completely and thoroughly established. Before the introduction of this root, it was impossible to cultivate light soils successfully, or to devise suitable rotations for cropping them with advantage. It was likewise a difficult task to support live stock through the winter and spring months; and as for feeding and preparing cattle and sheep for market, during these inclement seasons, the practice was hardly thought of, and still more rarely attempted, unless where a full stock of hay was provided, which only happened in a very few instances. The benefits derived from turnip husbandry are, therefore, of great magnitude: light soils are now cultivated with profit and facility; abundance of food is provided for man and beast; the earth is turned to its uses for which it is physically calculated; and, by being suitably cleaned with this preparatory crop, a bed is provided for grass seeds, wherein they flourish and prosper with greater vigor than after any other preparation."

Few of our readers are probably apprised of the fact, that English beef, so highly extolled, and of which John Bull so vauntingly boasts—and perhaps no people have better beef—is mostly winter fattened upon turnips and straw—very little hay being used. This will account for the high value which the turnip culture has obtained in Great Britain.

All the above named roots are well adapted to our soils and climate; and where their culture has been undertaken with spirit, and managed with judgment, success has been certain. The great objection to this culture has been, the labor which is required to se-

cure these roots from the frosts of winter; and yet the labor and expense required for this purpose are perhaps no greater than we expend in securing our grain and forage—if they are as great. Where cellars are not at command, or not adequate, these roots may all be securely preserved in pits, in dry situations, due precaution being had to covering and ventilation. It is the novelty of the labor, rather than the amount, and a want of practical knowledge and confidence of success, which intimidates and deters us. We *do* save our potatoes, and we *can* save other roots in like manner. Assuming the average product of hay at a ton and a half to two tons per acre, and of beets and ruta baga at 600 bushels—and allowing a bushel and a half of the latter, (90 lbs.) to be equal, for farm stock, to twenty pounds of hay, an acre of the roots will go as far in the economy of feeding as nearly three acres of meadow, to say nothing of the tops, which will go far to pay the extra expense of cultivating the roots—while the ground in one case is ameliorated and improved, and in the other impoverished. These roots, besides, may be used as a substitute for grain, for working cattle, and for pigs. The three acres of grass gives less than 9,000 pounds to the manure yard, while the one acre of ruta baga, or beets, gives 36,000, or four times as much as three acres of grass land.

VI. SUBSTITUTION OF FALLOW CROPS FOR NAKED FALLOWS.

Fallowing is the mode of preparing land, generally green sward, by ploughing it a considerable time before it is ploughed for wheat and rye, to be sown in autumn. A naked fallow is such as receives no intermediate crop between the first ploughing and seeding for the main crop: a fallow crop is one that intervenes between these two processes. In England, fallows are generally broken up in autumn, receive repeated ploughings during the ensuing summer, and are sown in autumn, or cropped with turnips, and sown the third year with barley. In the United States, naked fallows are more often broken up in June or July, receive repeated ploughings, and are sown in September. For fallow crops, old swards are broken up in autumn, and clover lays in the spring; the first receives one or more ploughings in the spring, and immediately after the seeds which are to constitute the fallow crop. Clover lays receive the fallow crop upon the first furrow, or with but one ploughing. Naked fallows, in England, occupy the ground a year; and if they are sown with winter tares or rye, as they often are, to be fed off in the spring, they are termed bastard fallows. With us fallow grounds lay idle but part of a season.

There is no agricultural writer of note, and very few good farmers, who now contend for the propriety of naked fallows, except on stiff clays, or wet grounds, which can only be worked in the summer, and this for the purpose only of being able to clean such soils from root weeds. We subjoin two or three quotations in corroboration of this fact:

"Fallowing was necessary as long as grains only, all of which exhaust the soil, were cultivated; during the intervals of tilling the fields, a variety of herbs grew on them, which offered food for animals, and the roots of which, buried in the soil by the plough, furnished a great part of the necessary manure. But at this day, when we have succeeded in establishing the cultivation of a great variety of roots, and artificial grasses, the system of fallowing can be no longer supported by the shadow of a good reason. The ease with which fodder may be cultivated, furnishes the means of supporting an increased number of animals; these in their turn supply manure and labor; and the farmer is no longer under the necessity of allowing his lands to be fallow."—*Chaptal.*

"It is already acknowledged, that it is only upon wet soils, or, in other words, upon lands unfit for the turnip husbandry, that a plain summer fallow is necessary."—*New Edin. Ency.*

"As there is only one good reason for fallowing, namely, to destroy weeds,—and as this can be done full as well by fallow crops, that is, by crops that require frequent hoeing and cleaning, during their growth, no fallows ought to be permitted in a good system of agriculture."—*T. Cooper.*

We have quoted in the last number of our fourth volume, the practical example of the late Chancellor Livingston, showing an increased profit, of nearly two hundred per cent, resulting from substituting fallow crops for naked fallows, besides an increase of cattle food, upon one hundred acres of arable land, of sixty-five tons, and the manure from sixty-five cattle, which this extra food would keep. In pages 88 and 104 of the same volume, we have given Greig and Beatson's systems of managing clay farms, in which naked fallows are dispensed with, and the profits doubled, by substituting fallow crops. These evidences might be greatly multiplied were it necessary; but we have so many examples and illustrations in every quarter of our country, that he who will may profit by his own observation and inquiry. The expense of the summer fallows may be saved, and a very valuable extra crop obtained, by the new mode of practice.

In regard to what are the best fallow crops? This will depend much upon the soil. Upon stiff clays, oats and peas are recommended, which although not cleansing crops, succeed well upon an undecomposed sod. Potatoes also answer well; and if they do not ripen early enough for winter grain, they prepare the ground remarkably well for spring wheat. Clays should be broken up in autumn, if intended for a fallow crop, that the frost may break down and pulverize the soil, and that the decomposition of the sod may commence earlier in the spring. The late John Lorrain, of Pennsylvania, who was an excellent practical farmer, as well as a gentleman of science, recommended, that in ploughing for grain, after a fallow crop, the furrow be supreficial, so as not to turn up the vegetable matter of the sod, but to leave it where the roots of the ensuing crop will most need it. Upon light soils, Indian corn, beans, peas, potatoes, turnips, or other roots, constitute good fallow crops, particularly preparatory to spring wheat and barley.

CONCLUSION.

We have gone over the ground we proposed to examine. We have endeavored to explain what we mean by the *New System of Husbandry*—to develope its principles, and to show WHY, and WHEREFORE, it is superior to the old or common system. We have, we think, demonstrated,—

1. That the *fertility* of the farm may be kept up, and augmented, by the manures it can be made to furnish;

2. That the *condition* of the farm may be much improved, by thorough draining;

3. That the *capacities* of the farm, can be fully developed only by good tillage;

4. That the *profits* of the farm, are materially augmented by alternating crops, and a system of mixed husbandry;

5. That the *cattle food* and *manures* of the farm, the main sources of fertility and profit, may be greatly increased by the cultivation of roots;

6. That the *labors* of the farm, may be economised, and its products further increased, by substituting fallow crops for naked fallows.

And finally, that were these several improvements generally introduced into our agricultural practice, they would render our farmers more independent, bring industry into better repute, and essentially promote the prosperity and happiness of all classes of society.

There is no doubt that most of our impoverished farms may, under the system of management we have been describing, and with the auxiliary and available aid of lime, marl, gypsum, swamp earth, ashes, &c. be progressively improved in fertility, and rendered productive and profitable. We have the strongest grounds for this belief. The like has been done in Great Britain, in the Netherlands, in Germany, in France. Worn-out lands have there been renovated and rendered very valuable. They have been so in the United States. They are now undergoing this improvement in the valley of the Hudson. The partial introduction of the New Husbandry, has, within a few years, doubled the surplus agricultural products of most of the counties between Albany and New-York; and yet the improvement has there been but begun.

The same management which our subject suggests for the renovation of old lands, will perpetuate the fertility of those which have been newly brought under culture. Although the soils of the great secondary formation of the west will not so soon become impoverished as those of primitive and transition formations; and though fertility may be more readily restored to them, when it has become exhausted—yet the same general laws govern in all. Deterioration will progress in all soils which are cropped, unless there is returned to them, in the form of manure, some equivalent for what is being constantly carried off.

The Conductor of the Cultivator will make it his business to continue to collect and publish practical instructions in rural affairs, and particularly in the improvements which it has been our object in this article to describe and recommend; in the performance of which, he respectfully invites the co-operation of practical farmers, in the various departments of husbandry, and in the different sections of our country.

Like Produces Like.

This is true, whether applied to aninals or vegetables. It is a law of nature, and therefore immutable. If we would multiply a choice breed of animals, a valuable variety of plants, or an elegant flower, we must take care to breed from the individuals in greatest esteem. Although we may be considered trespassing upon hallowed ground, we will venture to remark, that these truths are not unworthy of consideration in matrimonial alliances. Constitutional defects, intellectual as well as physical, are often hereditary in man; and an alliance between two persons disposed to pulmonary affections, for instance, will almost certainly entail this class of diseases upon their offspring. We will not enlarge upon this branch of the subject, but apply our remarks more particularly to the improvement of farm stock and farm crops.

But we may be asked, in the outset, why, if our position be true, do not the seeds of our apples, pears, plums, &c. produce the same fruits as the parent tree? Because, we answer, these fruits, like animals, have two parents, a male and a female parent, which seldom belong to the same variety; and having a parent of two varieties, or breeds, it necessarily follows, that the offspring will not exactly resemble either, but partake, more or less, of the qualities of both. In most of our orchard and garden fruits, the sexual organs exist in the same flower; yet, from the varieties that are associated in the same ground, the female organ is liable to be impregnated with the pollen of the male organs of half a dozen other kinds. We have seen this strikingly illustrated in an experiment with the Siberian crab. Seeds of this fruit, which grew in an orchard of other apple trees, produced more than twenty new varieties, all partaking, in some measure, of the peculiar properties of the female parent, and yet none of them exactly resembling it. Yet there is no doubt but the seeds of the Siberian crab, or of any other variety of fruit, completely isolated, during the season of blooming, from all other trees of a like genus, would produce fruits resembling precisely the parent.

The practice of crossing breeds of animals has led to the great improvement of our farm stock. The new varieties of wheat, oats, barley, potatoes, Indian corn, &c. spring from th accidental crossing of two or more old varieties. They arrest the attention of some observing individual, are preserved, propagated, and come into repute for their prolific or other remarkable properties. We have had a field of China beans adulterated by growing in contiguity with the small white and pole beans. Although every bean planted the second year, was to appearance a pure China bean, in their growth many of them sent up runners, and when gathered, a fifth part of the crop was either white or pole beans, with the pollen of which latter the blossoms of the China beans of the preceding year had become impregnated. The artificial crossing of fruits was first practised by Knight about the beginning of the present century. He began with the pea, with wheat, and the strawberry, and has extended his experiments successfully to the apple, pear, peach, &c. The varieties of our Indian corn have been greatly multiplied by incidental fecundation; and we heard a naturalist insist, the other day, that all the varieties of this grain had sprung from two species. It is to this natural tendency to mixture, in the cabbage, turnip and radish families, and the heedlessness of American gardeners in seeding different species and varieties in the same ground, that foreign seeds of these plants are in higher repute than our own—the practice in Europe being to seed each kind by itself, remote from any other species of the family.

From the preceding considerations it must be apparent, that if a farmer would have good stock, he should breed from only the best individuals; and that if he has not good individuals he should procure them, at any reasonable price; that he should select and breed from those which are best adapted to his grounds and his business—whether it be for the market, for the dairy, for labor, or for wool.

That if he would have good crops, he must select his seed with care; and having obtained that which is good, he should keep it pure, by not permitting it to become fecundated and deteriorated by growing along side of inferior kinds, and by carefully preserving the best samples to breed from.

We beg to refer to the communication of Gideon B. Smith, for an illustration of the crossing process, in vegetables, which came to hand after this article was written.

Hints for the Orchard.

The slopes of hills are better for the apple orchard than flat or level surfaces—because the trees are not so liable to be injured by stagnant waters, upon the soil or subsoil. Upon a northern aspect, the fruit is not so liable to be injured by late vernal frosts, as upon a southern aspect—because, the blossoms are later in developing. A rich soil will give the largest and fairest fruit; a dry and warm one the richest, and bring it to the earliest maturity. The soil should be sufficiently rich to encourage a moderate growth, but not so rich as to stimulate the plant to premature exertion. It is better to have trees obtain a fair size before they fruit much, as fruit exhausts the nutriment of the plant, and prevents growth; and a precocious tree is generally a short lived one. The distance between apple trees should vary from 25 to 40 feet, according to the habits of the tree—whether spreading much or growing upright, the quality of the soil, and the other uses for which the ground is required. The distance may be lessened between the rows, by planting in the quincunx form,

or planting the second row in the intervals between the trees in the first row—thus, * * * * * * * Ground may be still further saved, by planting in clumps, of five trees, the centres of which to be sixty feet apart, and four trees at ten feet from the centre, on each side, thus, * * * * * * * * *. This leaves large intervals unobstructed by shade; the fruit is gathered more readily, and the trees mutually protect each other from the wind. Hogs and other farm stock are like men, in relishing acid as well as sweet apples. The nutrient properties of the apple are not diminished by the presence of the acid. The roots of a tree conform to the shape of the branches, and generally extend under, as the branches do horizontally over the ground.

Children belong to the Republic.

Thus taught the Spartans, and thus we should teach. As the twig is bent, so will the tree incline. If we sow tares, we cannot expect to reap wheat. Children are the materials—the wood, brick and mortar, if we may so express ourselves—which are to compose our temple of freedom; and if these materials are bad, or unsound, dilapidation will ensue, and the beautiful fabric will ere long fall to the ground. If children are brought up in idleness, they are too often useless to themselves, and become a tax upon society. If they are not taught to do good, they will learn to do evil. If they are brought up in ignorance, they are in a manner unfitted to discharge the high duties which devolve upon freemen. If the mental soil is not cultivated, weeds, and brambles, and thorns, will spring up spontaneously, to the great annoyance of the community. As every man's vote weighs alike in the political scale, it were well for all that every man had enough of good sense and independence to cast his vote honestly. And the best way to insure this, is, to lay a good foundation of usefulness in youth—to teach the hands to work, and the mind to think. "Reading," says lord Bacon, "makes a full man, and thinking a correct man." Every citizen is in a measure dependent, for the preservation of the great blessings of freedom—security for his person and property,—upon the suitable education of the rising generation.

Children in our Factories.

It has ever been urged against large manufacturing establishments, that they tend to impair the health and deprave the minds, of the numerous children who are usually employed in their manipulations. The evil became so apparent and alarming in Great Britain, a few years since, as to call for official investigation; and on inquiry it was ascertained to be worse than was apprehended. Thousands of miserable victims of oppression, were found growing up in ignorance and vice, alike disgraceful to themselves, and dangerous to the community. And from being compelled to labor twelve to sixteen hours in twenty-four, in confined apartments, and fed on coarse and scanty food, they were generally in a sickly condition, and many had died from hardship and want. Parliament applied a prompt, though in the opinion of some, not a sufficient corrective. It excluded children under a certain age from these establishments; restricted the labor to ten hours in a day of the younger class to be employed, and we believe made some provision for their being educated.

This evil has also produced a legislative investigation in Pennsylvania; and the committee appointed to examine into the matter, we are sorry to say, have reported a state of facts disreputable to our country, and have proposed suitable correctives. The report is accompanied by the testimony, on oath, of a large number of operatives and employers. It states, among other things, that no particular attention is paid to the education of the children employed in the manufacturing establishments; that of all under eighteen years of age, not more than one-third can read or write; that the long hours of labor, (generally twelve hours per day,) close confinement, and vitiated air, have proved extremely injurious to the health of the children employed, those under twelve comprising one-fifth of all the operatives in these establishments.

The report recommends, that hereafter, no child under ten years of age shall be employed in these factories; that children in factories not able to read, write and keep accounts, shall be sent to school at least three months in every year; and that children under sixteen shall not be allowed to labor more than ten hours a day. "The destitution of education," says the Commercial Herald, "and moral culture, among the factory children, is astonishing. In the majority of instances children enter and grow up in our factories, without being able to spell, read or write. With broken constitutions, from excessive labor in youth, harassed with disease, and brutalized with savage ignorance, they reach manhood fit instruments for the purposes of demagogues, and ripe for every sort of crime and violence." "Where children are thus raised in ignorance," says Mr. Heastings, one of the witnesses examined, "and so totally devoid of the necessary improvement of their mental faculties, it is not to be wondered at that mobs and murders are so common in our large towns and manufacturing districts, where the people are kept in ignorance, and regarded but a little superior to the beasts that perish."

We have referred to this subject, in the hope of turning the public attention to the matter in our own state, where, if the like evil exists, it becomes the interest and the duty of all good citizens to see it promptly corrected.

Smut.—The fact is well authenticated, that after the seed of smut has been destroyed by steeping the seed in pickle, the *virus* may be again communicated to the seed grain, so as to affect the crop. Bauer took some kernels of wheat, which had been purified with salt and lime, and inoculated them, as it may be termed, with the dust of smut brand, that is, by pressing some of this dust into the suture or crease of the grain, and the product was smutty. This dust, or seed of smut, may adhere to a bag, to a barn floor, or indeed may be left in the soil, and, as we believe was the case with Capt. Greene, noticed in our last, brought in contact with the sown seed by water in the soil.

Salt Petre.—Great efficacy has been ascribed to this salt, applied in steeps for seed corn. We cited a case in our last, from Senator Johnson, of its great efficacy in the steep for seed wheat. In our March number we stated the experiment of Hart Massy, Esq. where the nitre seemed to have added vastly to the product, and served as a complete protection against the worm. A correspondent, whose favor is now before us, says—"Seed corn soaked in a strong brine of *salt petre* was found a certain preventive against the ravages of the grain worm [wire worm, or grub, we suppose] last year. Have you tried it?" In our noviciate in farming, being desirous of making some experiments with salt petre, we desired a mercantile friend, going to New-York, to buy us a small parcel of crude, cheap salt petre. He bought us a bag of 200 lbs! We placed it in our garret, and we have used of it for fifteen years, at the rate of a pint for half a bushel of seed, in the steep of our seed corn. So far as our recollection serves us, when nitre has been used, for we think it has been partially omitted in two or three instances, we have been very little troubled with the wire or grub worm. We have ascribed great potency to tar, in protecting the seed from birds and insects; but we have now our doubts whether our exemption from their ravages should not be imputed, at least in part, to the nitre employed in the steep. We particularly refer to this subject now, in the hope of inducing satisfactory experiments in the current month. The oxygen, of which the nitre is principally composed, has a salutary and powerful influence on the germination of seeds; the impregnation of the grain with this salt may render it offensive to the worm, while it cannot fail to impart some fertility to the soil. We hope that experiments may be made in this matter, and that we may be favored with the results.

The Grain Worm.—We beg to call the attention of the reader to the communication of C. in our last number. It asserts two facts in regard to the grain-worm, at variance with received opinions. 1. That the insect is *viviparous*—not *oviparous*—that is, that it does not produce eggs, but brings forth its young in a living state; and 2, that it is not the offspring, or maggot, but the parent, or fly, which causes the mischief. From the high character of our correspondent, as an entomologist, we are disposed to pay a respectful deference to his opinion. We hope the matter will receive further elucidation the coming season.

The least of the bugs.—We would also ask the attention of the reader to another communication from "C." under the above head. It involves matters of deep interest to the farmer. The insects of which it treats are supposed to produce the ergot in rye, quack grass and spear grass (poa pratensis.) The alarming epidemic which prevailed in New-England in 1811-12, has been imputed to the deleterious effects of the ergot in rye of the preceding season. And at this time a great mortality pervades the west, among cattle, which is believed to be caused by the ergot of the grasses we have named. There is not the shadow of doubt but that ergot is poisonous to men and brutes; that it abounds upon the plants we have named, much more in some years than in others, and that without special care, it enters into the food of man and beast. Threshing and thoroughly cleaning rye, divests the grain of most of the poison; but means are seldom taken to separate it from the food of the brute. We have seen fields of spear grass, which is wont to crowd out and take the place of other grasses, as meadows and pastures increase in age, seemingly covered with ergot. The best preventive we know of in this case, is to alternate crops where it can be done, and to give such high culture as will ensure the growth of what are termed the cultivated grasses; and where this cannot be done—or where the lands are doomed to perpetual meadow and pasture, to top-dress them with dung and compost—to seed and scarify them, that the healthful grasses may be maintained and perpetuated.

Morus Multicaulis.—We would also invite the attention of silk growers to the communication of Professor Ives, in our last. His experiments go to show, that the morus multicaulis, which has made no little noise, and induced some extravagant speculations, is not a distinct species, but merely a variety of the common white mulberry. It is a peculiar trait in the American character, to believe, without examination, and upon the slightest authority, whatever promises to administer to our cupidity. We have stood alone in admonishing the public, that the multicaulis, and even the white mulberry, was too tender for our northern winters, and in advising to cultivate them in stools, so that if the tops were killed, a surer dependence might be had upon the new annual growth which might spring from the roots. And we very much fear, that unless the Brussa proves more hardy than the multicaulis, or even the alba, and we have reason to believe that it will, we must, in the north, either resort to our indigenous hardy species, the M. rubra, or come short of our expectations in being able to produce our own silk.

The Brussa Mulberry.

Six thousand plants of this species, or variety, of the mulberry, belonging to the estate of the late David Ruggles, Esq. of Newburgh, were sold at auction on the 7th April. The sale was well attended, and the plants, though many of them small, went off at an average price of about thirty cents. There were samples of cocoons and of manufactured silk, fabricated from this mulberry, both of which were highly admired. The wood of this plant, although the trees were closely planted in nursery, appeared perfectly ripened and fresh, even to the terminal points, and wholly uninjured by the cold of winter; and the impression seemed to prevail, that it is hardy enough to withstand our northern winters. Brussa, from which this mulberry derives its name, is in Asia Minor, at the foot of Mount Olympus, which mountain is capped with snow during most of the year. Brussa silks are distinguished in the bazaar of Constantinople as pre-eminent for beauty and excellence. We anticipate great national benefits from the introduction of this valuable plant.

When attending the above sale, we were presented with one hundred plants of the mulberry, by Mr. Nicholas Haight, of New-York, which were imported late in the spring of 1837, from Smyrna, as the Brussa. On comparison they seem to be identical in variety with those sold. Mr. Haight has 10,000 on hand for sale. See his communication.

Mr. Whitmarsh, of Northampton, presented us, at the same time, a bundle of plants of his Canton mulberry. They are evidently different from the Brussa, and we should think not so hardy. We have planted the two kinds presented to us, and those we purchased at the sale, along side of each other, and hope, another year, to speak more satisfactorily of their hardiness and relative properties.

Cattle Husbandry.

Although we have been in the habit of appropriating a large portion of our paper to tillage husbandry, and have particularly urged the alternation of crops, and the cultivation of roots—yet we are aware, that, in many portions of our country, and even of New-York, which has been denominated the grain-growing state, cattle and sheep husbandry must ever constitute the most important and profitable business of the farm—that meat, wool, and the products of the dairy must form the great staples of trade. The lands denominated pine lands, comprising sands and sandy loams, are particularly adapted to alternate husbandry; and even upon these, it is desirable to rear as many cattle as can be well fed, as the best means of preserving or improving their fertility. Our valleys, particularly of the larger streams, as the Hudson, Mohawk, Susquehannah, Chemung, Genesee, &c. are adapted, generally, to the culture of grain, as is also the northern section of West New-York. In these, at least, for the present, cattle seem to be but a secondary object. But the hilly district lying west of the valley of the Hudson, south of that of the Mohawk, and the basins of the small lakes, and north of the New-Jersey and Pennsylvania lines, is peculiarly adapted to cattle and sheep husbandry, as is also much of that north of the Mohawk valley, and east of the Seneca river. These districts may be made to furnish the bread-stuffs necessary for the subsistence

of their population; but the great staples of trade must be farm stock and their products. Nor does this augur bad for the future prosperity of these districts. While the demands for meat, butter, cheese and wool, are likely to increase, the fertility of the soil, under judicious management, is likely to improve, and with it the condition of the population. We may confidently predict, that, at no distant day, the best portion of our population, that is, the most intelligent, the most independent, and the most republican in their principles and habits, will be found in these districts. Though there may not be so many that possess great wealth, there will be a larger portion who possess competent wealth—though not so much ostentation and extravagance, there will be less want and more substantial comfort, more equality and social enjoyment—in the cattle, than in the grain growing districts. It is worthy of remark, that in those districts where attention has been given particularly to the dairy, the condition of the husbandman has been rapidly improving. This remark applies to Orange, the northern part of Delaware, portions of Herkimer, Oneida, Otsego, &c. &c.

We gave, in our March number, some directions for renovating and improving old meadows and pastures. We now proceed to give some suggestions

ON CONVERTING ARABLE, OR PLOUGH-LAND, INTO PERMANENT MEADOW OR PASTURE.

The first obstacle to encounter, is the practice, yet too prevalent, of throwing plough-land into old field, or pasture, without stocking it with grass seeds. We lay it down as an unerring rule in good husbandry, that ploughed fields, intended to be converted in pasture or meadow, should be well stocked with grass seeds; and as next in importance, that as many species of grass seeds be sown as can be procured, or are adapted to the soil; and that, if possible, there be included the seeds of those grasses which are either indigenous to, or which are found to thrive well in, the immediate neighborhood, and in similar soils. The reasons for recommending several species are these: Each kind has its particular season of growth, and exhausts a particular food in the soil; and by multiplying the number, we are more apt to obtain a constant growth of herbage, and a far more abundant supply of feed. Thus, for instance, say a square foot of surface will support but six stocks of timothy,—this grass, growing neither very early, nor very late, the herbage would neither be abundant nor permanent. But the same square foot which would support but six plants of timothy, would support, at the same time, because every kind requires its specific food, six plants of five other species, say meadow fox-tail, red clover, white clover, orchard and tall oat grass, or species of the agrostis or fescue families. Of these six kinds, some one would be in luxuriant growth at all seasons, and the herbage would be increased from three to four fold, if the soil be good, by the admixture of the different seeds.

We cannot too often repeat, that pastures and meadows are almost as much benefitted by a rich soil, and a soil moist, not wet, as arable husbandry. The food of the grass, as well as of the grain crop, must come mainly from the soil; and if this food is scanty, the crop will, in like manner, be scanty. And again, the more nutritious grasses will not grow on soils habitually wet.

"The products of natural meadows," says Armstrong, "have been carefully and skilfully analyzed in Germany, in Italy, in England and in France, and the result shows, that wet meadows contain the smaller number of the different species of plants, but the greater number of those which are either useless or injurious; and, on the other hand, that *moist* meadows contain the greater number of the former, and the smaller number of the latter. The following simple table exhibits, at a glance, the present state of knowledge on this important part of our subject:

	No. of plants.	*Useful.*	*Useless or bad.*
In wet meadows, ...	30	4	26
In dry "	38	8	30
In moist "	42	17	25

"The agricultural labors suggested by these facts, are of two kinds,—the eradicating of useless, pernicious plants, and the continuance and multiplication of those which are good. The first of these objects is promoted by mowing the meadows before the seeds of noxious plants ripen, by pasturing them once in three years, by sheep, horses and cattle, in succession; by harrowing them in the spring and fall; by destroying by hand perennial weeds, and lastly, by sufficiently draining those that are wet.

"Many pernicious plants are annuals, and are killed by the first of these operations. A similar effect is produced by the second; the harrow or scarifier will destroy mosses or other weeds, whose roots are fibrous and superficial; the hand hoe will extirpate such taprooted plants as resist the harrow, and are refused by cattle, and draining will expel all worthless aquatics."*

In order to obtain seeds of indigenous kinds, which are not to be had in the shops, it is common, in Europe, to have the seeds carefully gathered by children, which being sown on a well prepared piece of ground, and taken care of, will soon yield seeds for farm culture. It is easier to accommodate the plant to the soil, than to adapt the soil to the plant.

In laying down lands to permanent meadow or pasture, it is all important to have the soil perfectly broken and pulverized; as the future value of the crop will depend upon the perfect germination of the seeds, and this cannot be expected without a thorough pulverization and preparation of the soil. It is also important to sow plenty of seed. The ground, to be sure, will sustain and nourish only a certain number of plants; yet it is better to go to an extra expense for seed, than to have a deficiency of plants. It is usual, in Britain, to sow from ten to sixteen pecks of grass seed to the acre on lands intended for permanent grass, and embracing from six to a dozen species. Another practice there, entitled to our notice, in laying down lands permanently to grass, is to sow grass seeds exclusively, that is, unaccompanied with any sort of grain. A good turf is the main object; and if grain is sown with the grass seeds, it robs the soil of much of the food which is necessary to nurture the young grass; and permanent value is thereby sacrificed to temporary and comparatively trifling profit.

The best time for sowing, for permanent grass lands, is said to be the early part of autumn, say in August or the first of September, in order that the plants may become well established before winter. Or, the more hardy kinds may be sown then, and the tenderer kinds sown upon the same field in the spring, as we sow clover upon the winter grain. As the seeds of grasses are generally small, the use of the roller, to pulverize and press the earth upon them, and to smooth the surface, is almost indispensable in good husbandry. It is considered of great advantage to give a light dressing of compost, or rotted dung, to young grass; and to avoid feeding it with heavy animals the first year, before the turf has thickened and become firm.

If the grounds laid down in grass are intended for permanent meadow, reference should be had to the grasses which are fit for the scythe at nearly the same time. For information on this point, we refer to p. 30, vol. IV, and to pages 11, 33, 47 and 63, vol. III. of Cultivator.

Should pasture and meadow be made to alternate, or should fields be kept exclusively for each? The American practice is not to alternate; and yet there seems to be substantial reasons for a contrary course. The object in both cases is to obtain the greatest quantity, and best quality of food for farm stock; and this object is promoted, in both cases, by scarifying, draining, top-dressing. Labor is as profitably laid out in improving our pasture, as our meadow grounds. But feeding and mowing have different effects upon the soil. In one case the crop is annually carried off, and in the other consumed upon the ground. Meadows, therefore, diminish in fertility; pasturing increases the fertility of the soil. Is it not proper, for this reason alone, to alternate, in order to keep up fertility? But there is another argument: Pastures soon abound with biennial and perennial plants, as thistles, mulleins, &c. which, as cattle do not consume them, mature and shed their seed, and multiply rapidly. Whereas, if occasionally converted to meadows, these plants would be cut down, before the seeds matured, and at least the biennials would be soon extirpated. These weeds are as prejudicial in pastures, in diminishing the quantity of herbage, as they are in meadows, and the same good management requires their extirpation in both.

Something depends *on the size of enclosures*. Small enclosures, say ten acres, are believed to be better than large ones. Grass grows better when there is no stock upon it, than when it is subjected to the constant tread of heavy animals; hence it is deemed economical to shift cattle occasionally from one enclosure to another. Another advantage of small enclosures is, it enables the farmer to keep different classes of stock separate, and thereby prevent injuries which often occur to weaker animals from running with stronger ones.

"Respecting the *stocking of enclosures*—(we quote from Br. Husbandry,)—it is the opinion of the most intelligent graziers, that the cattle fed upon them should be divided in the following manner. Supposing four fields, each containing a nearly equal quantity of land, one of them should be kept entirely free from stock until the grass has got up to its full growth, when the prime or fattening cattle, [or the cows, where the dairy is the prominent business] should be put into it, that they may get the best of the food; the second best should then follow; and after them, either the working or store stock, with lean sheep to eat the pastures close down: thus making the whole of the stock eat over the four enclosures in this succession:—

No. 1. Clear of stock, and reserved for the fattening beasts or cows.

No. 2. For the fatting beasts, till sent to No. 1.

No. 3. For the second best cattle, until forwarded successively to Nos. 2 and 1.

No. 4. For stores and sheep to follow other cattle, then to be shut up until the grass is again ready, as at No. 1, for the fattening beasts." p. 482.

"*Land that is constantly mown, must also be frequently manured*, or it will be thrown out of heart." There is no doubt on this point. If the crop is annually carried off, and nothing in the shape of vegetable matter returned to the soil, the land must and will deteriorate, till the crop will not pay the labor of gathering it. Those, therefore, who will have *good* permanent meadows, must, once at least in four years, give it a bountiful top-dressing of dung.

* Treatise on Agriculture, p. 126-7.

Agriculture of Massachusetts.

First Report of the Agriculture of Massachusetts, by HENRY COLMAN, *Commissioner for the Agricultural Survey of the State.*—Boston, pp. 140—8vo. 1838.

The distinguished gentlemen to whose politeness we are indebted for copies of this report, will please accept our thanks. It is the first report of a strictly agricultural survey ever made, we believe, on the new continent, and embraces barely the county of Essex. As we consider it the pioneer of many which are ere long to follow, in that and other states, of a like nature, we will endeavor in our next number to notice so many of the good practices in husbandry which it exhibits, and to point out such of the bad ones, as our restricted limits will permit, and the interests of our patrons demand.

Massachusetts Statistics.

The legislature of Massachusetts, in 1837, required the assessors of each town to make returns to the secretary of the commonwealth, before the first of October, of certain statistical facts in regard to the industrial resources of the state. These returns have been published in a pamphlet of 200 8vo. pages, accompanied by an abstract in tabular form, and a copy has been sent to us by some unknown friend. The plan of thus collecting and concentrating these data, so important to all classes, must be apparent to every one who examines the publication, and we cannot but indulge the hope, that our legislature will see the expediency of adopting the example of a sister state, as well in this, as in the liberal encouragement which she extends to her agriculture. The abstract contains the aggregates of each county. We make the following extract from the general summary, the footing of which shows, that the capital invested in the branches of industry noted, principally manufactures, amounts to $54,851,643; that the value of the annual product is $91,765,215; and that these branches of labor give employment to 117,352 of her population. We have selected but a small portion of the items.

Articles manufactured or produced.	Value.	Hands emplo'd.	Capital.
Axes, scythes, snaiths, &c.	325,956	387	196,938
Bonnets (straw) and palm leaf hats, ...	1,902,803		
Boots and shoes, ...	14,642,520	39,068	
Brushes, brooms & baskets,	289,512	350	103,095
Buttons of all kinds, ...	246,000	353	147,200
Cotton goods, (cloths,)	13,056,659	19,754	14,369,719
Cotton batting, thread, warp and wicking, ...	169,221	151	78,000
Cotton printing, ...	4,183,121	1,660	1,539,000
Fishery, whale, cod & mackerel, ...	7,592,200	20,126	12,484,078
Glass, ...	331,076	647	759,400
Hats, ...	698,086	869	
Leather, including morocco,	3,254,416	1,798	2,033,423
Nails, brads and tacks, ...	2,527,095	1,095	1,574,000
Oil, (refined whale & other,)	2,630,321	145	1,133,500
Paper, ...	1,544,230	1,173	1,167,700
Silk, ...	56,150	125	137,000
Stone, (granite, marble, slate and soap,)	680,782	1,177	209,950
Wool, ...	539,689		2,842,778
Woollen goods, ...	10,399,807	7,097	5,770,750

The Aim and Fruits of Philosophy,

According to the Baconian creed, should be "the multiplying of human enjoyments, and the mitigating of human sufferings;" "the relief of man's estate;" "the comfort of mankind;" "to enrich the human race with new discoveries and possessions;" "to endow mankind continually with new powers and works." Two words, says Bacon's biographer, form the key of the Baconian doctrine—utility and progress.

The odium cast upon philosophy by the events of the French revolution, excited, in the minds of many, an undue prejudice towards it, and probably deterred thousands from those studies and investigations which are most eminently promotive of human happiness. We have often heard the term *philosophy* employed, by the ignorant or prejudiced, as denoting something repulsive to our moral feelings; and yet we are indebted to it for most of the comforts and enjoyments of civilized life. It not only multiplies our enjoyments, but it teaches us how to avert the ills of life, and, when they do overtake us, how to mitigate their

rigor. It calls into action those powers which distinguish man from the brute, and which are given him, with the implied promise, that the harvest shall be in the ratio of the culture which he bestows upon his mind. We make these remarks, because we have hardly yet become divested of the prejudice excited in our younger days, against whatever bore the semblance of modern philosophy; while at the same time we have sedulously studied it, under various names, and believe we have derived a profit from it, which in some measure, we hope to impart to others; and because we would excite the young reader to investigate its principles, and to profit from its precepts.

The writings of Sir Francis Bacon form an era in philosophy, as well as in social improvements. The following enumeration, from the Edinburgh Review, of the benefits which his philosophy has conferred on society, may tend to excite a taste, even in the farmer, for the higher and nobler studies.

"Ask a follower of Bacon," says the Review, "what the new philosophy, as it was called in the time of Charles the second, has effected for mankind, and his answer is ready—'It has lengthened life; it has mitigated pain; it has extinguished disease; it has increased the fertility of the soil; it has given new securities to the mariner; it has furnished new arms to the warrior; it has spanned great rivers and estuaries with bridges of form unknown to our fathers; it has guided the thunder-bolt innocuously from heaven to earth; it has lighted up the night with the splendor of day; it has extended the range of the human vision; it has multiplied the power of the human muscles; it has accelerated motion; it has annihilated distance; it has facilitated intercourse, correspondence, all friendly offices and dispatch of business; it has enabled man to descend to the depths of the sea, to soar into the air, to penetrate securely into the noxious recesses of the earth, to travel the land on cars which whirl along without horses, and the ocean in ships which sail against the wind.' These are but a part of its fruits. For it is a philosophy which never rests, which has never attained it, which is never perfect. Its law is progress. A point which was yesterday invisible, becomes its goal to-day, and will be its starting-post to-morrow."

$100 premium for American Silk.

An association of gentlemen have obligated themselves to pay to the treasurer of the American Institute, New-York, the sum of one hundred dollars, to be awarded in October to the person "who shall raise, and cause to be manufactured, the greatest quantity of sewing silk, on not less than one-sixteenth of an acre of land, by a succession of crops in a single season, and exhibit satisfactory evidence of the same to the committee of the said institute, on or before their next annual exhibition at New-York, together with the weight of the mulberry leaves consumed, the weight and number of cocoons produced, and the weight of waste silk and floss, and the number and quality of the trees set on the land. The amount of land, and also the weight of leaves which may from necessity be borrowed from any other source to complete the experiment, together with all the material facts, to be certified to the committee on oath or affirmation. To this statement will also to be subjoined the number and condition of the trees which are produced on the land at the end of the season." The gentlemen who sign the notice are an ample guarantee that the premium will be paid.

Operation of Marl.

Marls are held to be valuable, for spreading on land, in proportion to the quantity of calcareous matter which they contain.

Clay-marl, as it is termed, is composed of carbonate of lime, silica and alumina, with a portion of the oxide of iron or manganese. It occurs in beds, and is extensively diffused. It assumes a considerable diversity of aspect and character, as it is more or less indurated, or as the calcareous or aluminous matters prevail. When very indurated, it is frequently termed rock-marl.

The operation of marls is more slow than that of lime, and they require to be applied in comparatively larger quantity. They should be laid upon the surface, and generally well exposed to the influence of the atmosphere, before being mixed with the soil. Some marls have been found to be very deleterious, unless they have undergone this previous exposure to the air. The kinds of soils to which clay marls are most beneficially applied, are the sandy, gravelly and peaty. In this case they supply calcareous matter to the soil, and improve its texture by the addition of alumina.

The quantity of this substance applied is exceedingly various, being dependent upon the nature of the soil, and the proportion of calcareous matter in the marl. Where the purpose has been to change entirely the constitution of a defective soil, it has been applied even at the rate of from 300 to 400 cart-loads to the acre. But where the purpose is to give merely a common manuring, it is supplied in the quantity sufficient to afford an ordinary proportion of calcareous matter. It may be laid upon the surface of land when in grass, where it remains till the land is brought under tillage; and this is the best method of applying it.

Shell marl is an entirely different substance. It is chiefly a deposite of marine, and sometimes of land shells, found under a bed of peat. It may be used at the rate of twenty-five to thirty cart-loads to the acre. It can be applied to the land when in various states, as when it is in stubble, in summer fallow, or in grass. The latter is a good practice; for, as in the case of all calcareous matter, the application improves the herbage; and the mineral, sinking into the soil, prepares it well for producing crops of corn when it is broken up for tillage. Its operation is not so quick as that of calcined limestone, but its effects are more lasting. The same consequence is produced by excessive cropping after the application of this substance, as after the application of calcined limestone. The soil which has been stimulated by the action of the mineral becomes more barren than before, and it is for the most part only to be restored by rest and the action of animal and vegetable manures.—*Low.*

Experiment in Harvesting Corn.

Andrew Nicol has given in the March No. of the Farmers' Register, a statement of some experiments he made last year with his corn crop, the pith of which we abstract.

1. He took 32 loads of pine leaves on to a piece of corn, planted very close for the climate of Virginia, and spread these leaves so closely, as to give an average thickness of four inches. The corn received no after culture. The product was 75 bushels per acre, considered there a very large return. The pine leaves counteracted the effects of drought; and Mr. N. thinks, that had the covering been thicker, the product would have been greater.

2. The second experiment was made to ascertain the effect of topping, cutting up, and leaving the grain to ripen upon the standing stalk. Eighteen rows of 150 yards in length, were stripped of the fodder, that is, all the leaves, except two above the ears, were taken off on the 11th Sept.; the tops were cut from six of these rows on the 20th Sept.; six other rows of the 18 were cut by the ground the same day; and the third six rows were left to stand, together with the first six, until the corn ripened; the fourth and last six rows, from which neither fodder was pulled nor tops cut, was, on the same 20th Sept. cut off by the ground, and set up in small stooks. "The corn from each was gathered on the 2d Dec. and on the 7th Feb. shelled and accurately weighed. The following are the results, in measure and in weight:

1st	6	rows	measured	8	bu.	weight per bushel	58 lbs.
2d	6	"	"	7¾	"	"	57 "
3d	6	"	"	7⅝	"	"	56¼ "
4th	6	"	"	8¼	"	"	59¼ "

These results go to show,

1. That leaves are essential, even after corn is cut off at the ground, in increasing the quantity and weight of the crop. And

2. That the mode of cutting up the whole, grain, tops and leaves, gives the *most* corn, and *heaviest* corn, and certainly improves the quality, and increases the quantity, of cattle fodder. The difference between No. 2 and No. 4, will be seen to be nearly 10 per cent in quantity, and in weight nearly as much more.

The third experiment was in succoring corn. Mr. N. considered the result decidedly in favor of the practice. Where the corn was not succored, the ears were diminutive, and the succors produced little or no sound grain. There is no doubt but succors abstract food from the plants, and if taken off (we should prefer to *cut* them off) and well cured, furnish excellent forage; yet we have hitherto doubted if the gain would repay the labor of succoring. But we do not profess to be infallible in our opinions.

A sentiment of Franklin.—"I think agriculture the most honorable of all employments, being the most independent. The farmer has no need of popular favor, nor of the favor of the great: the success of his crops depending only on the blessing of God upon his honest industry."

Knight's Mode of Grafting in July.

It is thus described in Loudon: "The head of the stock is taken off by a single stroke of the knife obliquely, so that the incision commences about a diameter below the point where the medulla (pith) appears in the section of the stock, and ends as much above it on the opposite side. The scion, which should not exceed in diameter half that of the stock, is then to be divided longitudinally, about two inches upwards from its lower end, into two unequal divisions, by passing the knife upwards just in contact with one side of the medulla. The strongest division of the scion is then to be pared thin at its lowest extremity, and introduced, as in crown grafting, between the bark and the wood of the stock, and the more slender division is fitted to the stock upon the opposite side. The scion consequently stands astride the stock, to which it attaches itself firmly on each side, and which it covers completely in a single season. Grafts of the apple and pear rarely ever fail in this method of grafting, which may be practised with equal success, with young wood in July, as soon as that has become moderately firm and mature."

The grafting clay of the French and Dutch, is unguent de St. Fiacre (St. Fiacre being the patron saint of gardening,) and is composed of half cow dung, free from litter, and half fresh loam, intimately incorporated. They prefer this to all other for excluding the external air from wounds of every description, and ridicule the idea of complex compositions. We know from experience, that cow-dung alone is an efficacious application to the fresh wounds of trees, barked or bruised accidentally, and we have saved trees by its prompt application, where the bark had been entirely removed from a foot of the stock. The common grafting wax used in this vicinity is composed of one part of tallow, two parts of bees-wax, and four of rosin, melted and well incorporated. It should be thrown into tepid or warm water, when about to be used. A larger proportion of tallow will render it softer, and more easily managed. The wax or clay checks the extravasation of sap from the wounds; prevents the too sudden drying of the wood, and excludes the rain water from the wound or cleft.

A new mode of fertilizing land,

Has been announced in France, discovered by M. Jauffet, and tested by him and others. Several French societies have endorsed the inventor's claim to merit, and a learned committee has been raised in England to test its value to agriculture. It purports to be "*a process for obtaining cheap and valuable manure, without the aid of cattle.*" The old mode of converting vegetable matters into food for farm crops, has been that of first feeding cattle with them, and of then applying the dung and offal to the soil. The inventor of this new process proposes, if we understand his project, to convert vegetable matters into food for vegetables by a summary and speedy process, without the aid of the digestive organs of farm stock. We do not see that it adds any thing to the *materials* of fertility, but merely *cooks them*, if we may use the expression, and thereby expedites their conversion into new vegetable matter. The process consists in steeping straw, or other vegetable matters, in water, in which a certain proportion of lime, cinders and soot have been mixed. Fermentation ensues, and in three weeks the manure is fit for use. The *Journal des Comices Agricoles* gives the following proportions: 700 pounds of cut straw, or other vegetable substance, five hogsheads of common water, one and one-fourth hectolitres of quick-lime, three-fourths hectolitre of cinders, and one-fourth hectolitre of soot; this mixture to be well brewed for a couple of hours: and the vegetable substances, after having thoroughly imbibed the liquid, are to be heaped together, battened down, and covered with something to compress them well together; the heap is to be watered every five or six days, or as often as the heat of the fermenting mass diminishes. The hectolitre is equivalent to about 22¼ gallons. The straw or other vegetable matter is first cut in a machine; three men and a horse, with a machine, costing about $66, will prepare seven tons a day; and ten quintals of straw will produce 40 quintals of manure, either by the addition of the ley, or by the fermentation dilating the materials operated upon. We are afraid the discovery is not likely to prove of great benefit to this country, in many parts of which manure is not yet enough regarded to arrest the farmer's attention.

Hints in Husbandry.

[*From Loudon's Statistics of Agriculture.*]

NORFOLK.

Buildings.—Lime-wash is used as a preservative of boards. It is composed of lime, *fresh from the kiln*, and clean sharp sand, mixed with *hot* water, and *laid on hot*, stirring it up so as always to lay on sand mixed with lime. At Holkham, a brick manufactory, where bricks of all forms are made, and common bricks are cut, five parts in six, through in various directions, so as to give half and quarter bricks, angles, &c. without breaking and waste. This is one of the most complete manufactories in the kingdom. Sharp clean sand dashed on new paint is found to answer the end of imitating stone. Front edge of cattle manger rollers covered with tin, at Holkham; mangers themselves plated with iron, bottoms slate.

Improvements.—A good deal of draining done of late years; very little irrigation; among the manures are reckoned marl, lime, gypsum, oyster shells, soot, sea weed, pond weeds, burnt earth, sticklebacks, oil cake, ashes, soot, malt dust, ploughing in growing buckwheat, yard dung, leaves, burning stubbles, river mud, and town manure. Marling, or claying, as it is

called, [the soil being principally sandy,] has been much used for an unknown length of time, and is found of great use on the sands; laid on at all seasons, but chiefly on the clover leys in autumn, and spread to eighty loads an acre; duration twenty to fifty years. Sea ouse, a calcareous mud, forty loads per acre.

Grass.—Very little natural turf in the county, [the alternating system being generally adopted.]

BERKSHIRE.

Peat ashes, as a manure, almost peculiar to Berkshire, though they might be obtained by the same process wherever peat of the same quality abounds, as they are in Holland. An acre of peat land, at Newbery, now sells at 300 to 500*l.* though it formerly sold at 35*l.* The ashes are generally applied in March and April, from twelve to fifteen bushels the acre. The benefit two years.

Hogs.—The native breed are the best in Britain—improved by a cross on the China.

Poultry.—Near Oakingham, many are crammed for the market; they are put up in a dark place, and crammed with a paste made of barley-meal, mutton suet, and some treacle, (molasses,) or coarse sugar, and are found to be completely ripe in a fortnight. If kept longer, the fever that is induced by this continued state of repletion, renders them red and unsaleable, and frequently kills them.

YORKSHIRE.

Orchards and gardens.—A particular species of plum grows at Sherburn, and in its neighborhood, called the *Wine-sour*. It grows well in gravels and limestone, is hardy, and a good bearer. The fruit sells from 21*s.* =to $4.60 per peck, when sound and good, to 4*s.* 6*d.* when cracked and damaged. They are easily hurt by rain. [This plum is superior for preserves—may be had at the Albany Nursery.]

Live stock.—Near Leeds, where milk tastes of turnips, a tea-spoonful of dissolved nitre (salt petre) is put into eight gallons of milk, which entirely removes the flavor.

EAST LOTHIAN.

Grass.—Natural meadows or pastures are not admitted into the East Lothian system of husbandry, as they are found only where nature, or certain local circumstances render them, in some measure, unavoidable, and are never kept voluntarily, or from an idea of profit. Many farmers fallow land to lie a few years in grass, especially where it has been exhausted by long and imperfect tillage; but fields of this description are not be ranked as permanent pastures, for the object is to restore them, as soon as possible, to a state capable of bearing corn crops to advantage.

SCOTLAND.

Though Scotland was far behind England, in cultivation, till the middle of the last century, it has greatly now outstripped that country, especially in arable husbandry.

Economy of Health.

We renew our notice of this sterling work of Dr. Johnson, because it exhibits a profound knowledge of the human frame, and of the human passions and propensities, and abounds in wholesome instructions for the promotion of health and the enjoyment of rational happiness.

We have reached, in order, the fifth and sixth septenniads of life, extending from the 28th to the 42d years of man's age, which the Doctor denominates the Golden Era—the double key-stone of the arch of human life, in which our physical and mental powers are most successfully developed.

"This is the epoch," says our author, "of man's existence—provided he has not grossly violated the laws of nature and of temperance, or carried into the world with him some hereditary taint—in which all the functions of the body are so nicely balanced, that no one interferes with another. The circulation in the heart does not disturb the respiration in the lungs—digestion is performed without the slightest consciousness—sleep is a temporary death without dying—and man springs from his couch with keen appetite for food, and inextinguishable energies for mental or corporeal exertion. The organs of supply are now more than able to compensate for the waste occasioned by the ordinary wear and tear of life; because the machine has ceased to make demands for additional growth. Hence it is that we are capable, during the fifth and sixth septenniads, of undergoing fatigues of body, and excitations of mind, that would be ruinous to health either before or after these epochs of existence."

After discussing the subject of phrenology, in which the Doctor is a staunch believer, with some limitations, he proceeds as follows:

"I have hinted, a few pages back, that although the mental and corporeal *powers* attain their acme in the fifth and sixth septenniads, the intellect may yet display greater prodigies *after* the completion of that period, than it could have done *during* the golden era of moral and physical perfection. The reason of this is obvious. The mind continues to acquire knowledge long after the body has ceased to gain strength. And although certain powers of the intellect, as memory, imagination, or even perception, may be on the decline, yet the accumulated materials in the granary of the mind may, and often do, enable it to construct edifices of noble dimensions, and more durable architecture, than at earlier and more vigorous epochs of life."

This proposition is illustrated by the example of Shakspeare, Scott, Byron, Milton, Johnson, Bacon, Newton, Locke, Linnæus, &c. whose finest productions were written after they had passed the golden era, or the age of 42. These successful efforts of the mind, however, are ascribed to the "accumulated stores in the emporium of the soul, which have been laid up in earlier life." "If we hope to send forth corruscations of mind, says our author, in advanced age, we must charge the electric battery, (the minds material organ) in the prime of life. He who attempts, in the vale of years, he continues, to astonish the world with the elaboration of knowlede acquired after the completion of his sixth septenniad (42) and with energies of mind *not* exerted strenuously *before* that epoch, will find himself lamentably disappointed."

Emulation and Ambition.—"It is in the fifth septenniad that the *emulation* of youth gradually slides into the *ambition* of manhood. The change is so gradual as to be scarcely perceptible—like the mutations of figures in the magic lantern, or the transformations which fancy loves to trace in the moving panorama of clouds on a summer's eve. That which was in early life only a laudable desire to excel in literature, arts, science, or manly exercise, becomes in manhood a passion for outstripping and eclipsing our neighbors in rank, wealth, estimation, power, and all the thousand objects, paths and pursuits of AMBITION."

"What is *ostentation* in either sex, but the ambition of surpassing our neighbors, or equalling our superiors, in pomp and show? *Pride* itself is oftener nothing else than ambition, gratified and elated by the supposition, whether well or ill founded, that the individual is superior in personal importance, rank, riches, attainments, or other circumstance, to the generality of mankind."

Our author illustrates his position, that *emulation* in the school is the germ of *ambition* in manhood, by citing the cases of Napoleon and Byron among the dead, and of Peel and Brougham among the living, and continues,—

"These four illustrations might be multiplied ad infinitum, and easily made to prove several propositions, but especially the following, viz:—*First*. That the emulation of youth becomes the ambition of of age. *Secondly*. That talent is not developed at any period of life, unless it has *existed* from the beginning—in other words, that it is congenital, and not acquired; consequently that men are *not* born equal. *Thirdly*. That if any thing be entitled to the denomination of 'UNIVERSAL PASSION,' it is ambition taken in its extended sense." * *

"As common economy is most advantageously practised in the season of prosperity, so the ECONOMY OF HEALTH is most beneficially cultivated when we are in the fullest enjoyment of that blessing. The stings of unmerited penury are blunted by habits of previous moderation, and so the dangers and sufferings of accidental disease are obviated or mitigated by previous attention and temperance. It is in these two meredian epochs, however, that the seeds of various diseases, sown at much earlier periods, now take an activity of growth, and bring forth their bitter fruits. But, independently of these, the germs of many new afflictions, hitherto unknown to the constitution, are firmly planted, and soon fructify with disastrous fertility. The dry-rot of the frame, CONSUMPTION, which may have lain dormant for so many years, is frequently called into action about the beginning of the fifth or sixth septenniads, by causes which had not previously operated. But the great evil—the root of innumerable evils—the proleiform malady—DYSPEPSIA—the hydra-headed monster of countless brood and Medusa mien, is the progeny of civilization—and is much more indebted for its existence and diffusion to intellectual refinement, than to bodily intemperance—in other words, its causes, multifareous as they are, may be traced far more frequently to anxieties, cares, and tribulations of mind, than to improper indulgence of the palate or senses. This *nova pestis* was unknown to, or so rare as to be underrated by, our ancestors. This assertion need not stagger us. All diseases are the creatures, or rather the creations, of circumstances. Numerous maladies of antiquity have disappeared from the tablet of nosology, and others have taken their place. It may be proper to advert to syphilis and cholera, no authentic types of which can be found among the records of Greek and Roman medicine. To come nearer home, the diseases of the heart, one of the protean forms of the malady under consideration, were so little attended to before the French revolution, as to be scarcely noticed by medical writers. The portentious scenes of that eventful period called forth such a multitude of examples of this fatal disease, that a volume was soon written on the subject by Corvisart—and the mental excitation that has ever since continued, has kept up the tendency to affections of the heart, which are now among the most prominent and dreadful of human afflictions."

* * "To prevent the corporeal malady, and to diminish, as much as possible, the mental affliction itself, the individual must tread in the steps—haud passibus æquis—of Xenophon and Byron. He must "KEEP THE BODY ACTIVE, and the STOMACH EMPTY." I can answer for the value of this precept. It prevents not the individual from throwing into the prescription as much philosophy, and even theology, as he pleases. Of the *last* ingredient it becomes not me to speak, even comparatively; but of the two other items, I can conscientiously own, that they are as 'dust in the balance,' when weighed against the Græco-Byronian receipts which I have so strongly recommended. The poor man has not far to cast about in quest of the means for putting this principle into practice. Generally speaking, he adopts it, *nolens volens;* and hence it is that the most indigent suffer less from moral ills and misfortunes, than those who are far removed from want. As a man rises in rank and riches, he becomes deprived—or rather he deprives himself—not of the means, but of the inclination, to embrace the protection which this principle holds out. Among the inferior order of society, indolence and inebriety give a fearful impetus to the shock of misfortune, and soon induce a variety of corporeal disorders, that curtail the range of life, and destroy the springs of happiness. And even in the higher quarters, where we might expect better things, the mental afflictions, or the moral adversity, appears to paralyze the energies of the soul, prostrate all firmness of resolve, and place in complete abeyance all fortitude and power of resistance against the overwhelming evil! In such condition it is no wonder that temporary solace is sought in wine and other deleterious stimulants, which only smother the flame, like coals heaped on a fire, to make the combustion more fierce and destructive afterwards. From these sources are derived many of those hypochondriacal miseries, dyspeptic torments, and even intellectual aberrations, which we every day observe.—The application of the counteracting principle in question must be left to individual ingenuity. Women have less facilities for putting in practice than men, for obvious reasons; but fortunately they bear dispensations and vicissitudes with much more fortitude than their boasted superiors—the stronger sex."

Dr. Johnson then proceeds to show, that man is punished in this world—that he has a foretaste here of his final punishment hereafter—for the wanton violations which he commits of the laws of God and man. He then proceeds:

"The same reasoning may apply to rewards as to punishments. Because virtue, and merit, and talent, are not *apparently* rewarded on this globe, it does not follow that they are not *really* so. If the wicked man carries a hell in his bosom, the virtuous may and does maintain a heaven in his breast. Of all rewards, here or hereafter, HAPPINESS must be the greatest—and we have the authority of the great Ethic Bard, as well as daily experience, that

"Virtue alone is happiness below."

Even the HOPE OF REWARD in another world, based on conscientious rectitude of conduct and religious feeling, is in itself a reward beyond all estimation. It is an anchor in the storms of adversity."

Correspondence condensed.

THE GRAIN-WORM.

James Cooke, of Johnsonsburgh, N. J. professes to have adopted a successful mode of preventing the ravages of the grain-worm. The preventive consists in steeping the seed in a brine made of one pound of saltpetre, one pail of water, and two double handfulls of rye flour; and after the seed is drawn from the liquid, to put to it as much plaster as will adhere to it. It prevents injury from the worm, by causing a luxuriant growth. Mr. Cooke undoubtedly alludes to the Hessian fly, and not to what *we* call the grain-worm, as this latter has not yet reached that state. Whatever induces vigorous growth, tends to lessen the evils of the fly; but no steep, we are persuaded, will prevent the attack of the grain-worm.

QUANTITY OF GYPSUM PER ACRE.

A correspondent at Kingsville, Md. is anxious to know what would be the effect of applying a ton of plaster to the acre? And why not as beneficial in this quantity as lime or bone? Gypsum has been tried in various quantities upon land, at the rates of from one to twenty bushels per acre. In no case has any quantity above six bushels to the acre proved beneficial; and generally those who made the experiments have come to the conclusion, that no more than one to two bushels can be profitably applied to the acre. The reason why it differs from lime and bone, applied in large quantities, we apprehend to be this: It is the specific food of certain plants, not in its simple, but compound form; it combines with the other elements of these plants in a certain definite proportion; this definite proportion never exceeds say two bushels on an acre; and all that is applied beyond this is useless, otherwise than by improving the texture of a too stiff or too open a soil. Lime and bone benefit upon different principles.

CULTURE OF ONIONS.

The onion grows to full size in the northern states in *one* season; but in Pennsylvania and south, it requires *two* seasons to perfect its growth. There, the tops generally die the first season, when the bulb has attained the size of a filbert or walnut; these are planted out the second season, and come to maturity. J. H. King, of Georgetown, D. C. asks the cause of this difference, and wishes our directions for the culture of the onion.

The cause of the difference, we believe, is to be imputed wholly to climate: the warm weather of the

south impairing the elaborating organs—the leaves—and consequently checking the growth, before the bulb has time to acquire the full size. We remember seeing, in the garden of Col. McAllister, near Harrisburgh, Pa. a bed of full grown onions, which the owner seemed proud in assuring us, had grown from the seed that year, and which he stated as a remarkable circumstance. We made no inquiry when they were sown, but conjecture that the seed was sown the previous autumn, a practice which, according to Loudon, is common in Portugal, and is often practised in Britain. The onion in this case attains its full size by the first of August, before the intense heats of summer. Although the onion is said to be a native of Spain, it probably is indigenous to the mountainous regions, for it seems adapted to the temperature of this latitude. It withstands our winters, especially if protected by straw or litter. The onion planted for seed is often put out in autumn, or left in the ground for a second, after the first crop of seed has been gathered; it is often sown in September, and particularly the tree or bulb bearing variety. We recommend to Mr. King to sow in autumn, say in September or October, and at mid-winter, if the state of the ground will permit.

Onions are sown in this neighborhood from the 1st to the 25th April, on rich, well prepared ground, in drills 12 inches apart, and are afterwards thinned to a proper distance. The earlier they are sown, the sooner they come to maturity; and, well managed, are a sure and profitable crop.

The tree onion is said to come from a high latitude, where the climate being too cold for them to flower and seed, the flower becomes viviparous, and bears bulbs instead of flowers.

CORN AND COB CRUSHER AND GRINDER.

M. M. McFeer, writes us from Marysville, Ten. that an excellent machine for crushing corn and cob has been invented and put in operation by Mr. William Gault, of that place. Our correspondent assures us he has seen it in operation, and that it will crush and grind from 20 to 30 bushels of corn and cob in an hour, propelled by water or horse power. Such a machine is much wanted, and will meet with a ready sale, at a fair price, in every part of the country.

MACHINE FOR SOWING LIME.

William Wells, of Plainfield, N. J. notifies us, that he has patented a machine for sowing lime, which will spread any required quantity, from two to five hundred bushels on an acre, of lime, ashes or marl. A boy large enough to shovel, will, he says, with a horse, spread 700 bushels in a day, perfectly even. The machine will hold 20 bushels for one horse, or 40 bushels for two horses.

N. B. We must inform Mr. Wells, as well as others who like him are disposed to transgress our rules, that letters for their exclusive benefit, addressed to us, will not hereafter be noticed in the Cultivator—*unless the postage is paid.*

Italian vs. *Siberian Wheat.*—We must be excused from prolonging the controversy as to the relative merits of Italian and Siberian wheat, which we apprehend would neither profit the parties, nor enlighten the public. We have given our opinion, judging from an analysis of the grain, that the two species of wheat are identically the same. When they are ascertained to be different, it will be time enough to say which is the best.

Dutton Corn.—H. H. Eastman, of Marshall, Oneida, complains, that corn which he obtained as Dutton corn, at Albany, proved an entire failure; that the stalks grew strong, and six or eight feet high; but that the corn did not ripen, while other kinds came to maturity. Mr. E. we venture to say, did not plant the Dutton corn; as this is of rather dwarfish growth, and with us has never been injured with frosts. Mr. Thorburn has informed us, that in the spring of 1837, he sold a quantity of seed corn as Dutton, which he believes was not such, as in every instance that he has heard of it has proved a large growing late corn.

Hessian Fly.—Timothy S. Olmsted, of Croton, Westchester, sends us the following directions for preventing injury by the Hessian fly. Mr. O. is informed, that this fly and the grain-worm *are not* the same.

"As soon as wheat shows two blades after sowing in the fall, sow two bushels of good wood ashes per acre. Repeat the same the first and last weeks in April, and as late in the month of May as the sower can pass over it without injury. As the first and second times are past, (that is, fall and first week in April,) I would recommend the sowing of three bushels per acre any time in April, and three in May."

An extraordinary calf has been raised by Austin Harmon, jun. of Bennington, Vt. which, on the 29th March, the day he was one your old, weighed *one thousand and three pounds!* He is of the Short Horned Durham breed. This calf, Mr. Harmon writes us, sucked the dam ten days, was then fed with new milk twenty days, and after that with skimmed milk and a little oat-meal, till he was six months old; since which he has had neither grain nor milk, but has been kept upon hay and raw potatoes.

Value of Gypsum.—Barnabas Miller, of Catharine, Chemung, has sent us the result of some experiments with plaster. A row of potatoes not plastered yielded 49½ pounds of tubers, while a row along side, which he plastered, gave 90 pounds—a difference of nearly one-half in favor of the plastered row. Mr. Miller says the difference upon his corn was nearly the same, a tablespoonful being applied to each hill, after the first hoeing. The soil a gravelly loam. Mr. M. recommends the sowing a bushel an acre on grass grounds, about the first of May, and he thinks its benefits are manifest the second season. We join Mr. M. in begging farmers who do not use plaster to *try it*—on their meadows and pastures, on their corn, potatoes, &c.

Hog manure, D. Gillet is informed, in answer to his queries, cannot be applied amiss. Hot manures, as hog and horse dung, are best applied to cold moist land, cow and fermented manures to dry or warm land. Much, however, depends upon the degree of fermentation they have undergone, and reference should be had to crops, rather than soils. If unfermented, they should be applied to an autumn-ripening crop. Mr. G. thinks the best mode of applying manures for his corn is to spread it, and then gather his land in one bout ridges. This brings the manure spread upon three furrows into the space of one furrow. There is no doubt of the superior benefit of this mode of dressing to the first crop, yet it may be doubted if it is ultimately most beneficial to the crops which follow, or to the soil.

Threshing Machines.—J. G. M. Ramsay, of Mecklenburgh, Ten. asks our opinion of the relative merits of threshing machines. We have no better data to judge from, than is afforded by our columns. We repeat, the threshing machine and horse-power are distinct; and that generally more depends upon the latter, as to the points of inquiry,—if portable, cheap, simple, and requiring but one horse—than on the thresher. Most of the threshers we have seen and described, do their work thoroughly; but in relation to the horse-power, we feel wholly incompetent to decide as to the relative merits of the different ones in use.

Acknowledgments.—Among many acknowledgments that are due to correspondents, we record the receipt of twenty-four kinds of prairie flowers from Mrs. Hamilton, gathered by her on the prairies of Wisconsin, geological and agricultural reports from Gov. Everett, Rev. Mr. Coleman, Prof. Mather, Dr. Perine, and several members of congress; red blaze corn from H. Luce, &c.

CORRESPONDENCE.

Importance of the Ruta Baga Crop.

Whalen's Store, 29th March, 1838.

DEAR SIR,—So much has been said and written on root culture of late, that I feel a diffidence in attempting any thing new or profitable on the subject; should you, however, find a crumb in the following worth notice, you may use it as you think proper.

I commenced raising the ruta baga five years since, and can truly say, the more I know of them, the better I like them. Last season I raised 700 bushels on ground that would measure not to exceed three-fourths of an acre, after making a deduction for fifty pine stumps on the same. I sowed the 20th June, at the rate of two pounds of seed per acre, on ground which had ruta baga the season previous, ploughed once, harrowed down, laid off into furrows two and a half feet apart, two-thirds filled with long manure; a two bout ridge thrown back on the same, and the seed sown on top; hoed twice, passing the cultivator each time, and thinned down to one foot apart in the rows. A frequent mistake is crowding the plants too much; they must have room, air and light; all they are crowded nearer than rows two and a half feet apart, and a foot in the row, will surely diminish the amount of crop.

Two pounds of seed to the acre will give generally four times the number of plants necessary; but I find the extra expense of seed and trouble in thinning out amply repaid by the saving of time in transplanting and filling up vacant places; besides the transplanted ones never do as well as those left undisturbed.

As an experiment, I commenced the 1st September last, depriving every second row of all except the crown leaves, feeding them morning and evening to my milch cows. The result was, the milk increased nearly fifty per cent; the crop, when gathered, showed no difference in the rows. I pulled, topped, bottomed and put into the cellar with ease, at the rate of 100 bushels per day to each hand. I calculate the cost in the cellar at four cent per bushel. My store pigs have been wintered on them raw, with no addition, save the wash from the house and a little buckwheat and rye bran; they look well, and when I undertook a few days since to substitute raw potatoes, they would hardly deign to touch them.

I have tried mangold wurtzel each year of ruta baga, and were I to give any instruction as to its culture, would say, like Cobbett in his Cottage Economy, "wherever you see ruta baga, read mangold wurtzel," only sow early in May, and soak your seed at least twenty-fours hours in tepid water. I consider ruta baga much the most certain crop, and the difficulty in preserving through winter much less.

My drill-barrow sows most kinds of seeds; is pretty much of my own inventing two years since; cost in making about $2.50. Can all be made by a common carpenter, except the tin barrel; sows as much and as well as those costing $10 or $12. It is a great labor saving machine, every person engaged in root culture should have one. I am sanguine in the belief that the root culture will continue to increase here in the same ratio it has done in Great Britain, and that eventually the revolution in our agriculture from that source will be equally great with theirs; and whilst we see two blades of grass growing where but one grew before, we shall soon find ten bushels of roots growing where a short time since not one was thought of.

Respectfully yours,

J. BUEL, Esq. SETH WHALEN.

Improvement of Grass grounds.

Cedar Brook, Plainfield, N. J. 22d Mar. 1838.

JESSE BUEL, Esq.—Dear Sir,—I am a general convert to the *new system* of husbandry, but not without some important exceptions. Nothing is more common, than while we are endeavoring to avoid one error, to run into another in a contrary direction. I remember a remark of an elderly man many years since, who observed, that he had been endeavoring for a long time to understand and follow the *true* line, but he had come to the conclusion, that he was never *on* the line, except when he was crossing it.

I believe in the propriety of a rotation of crops on a large proportion of our lands; but I am acquainted with many pieces of meadow and pasture lands in New-England, the former of which are more valuable than any lands in that part of the country, which have never been ploughed within the memory of the present generation, which, in favorable seasons, produce two good crops of hay, and yield much after feed, with only a top-dressing of manure once in two or three years; and if not fed *too close* in the fall, do not deteriorate; while the pasture lands, without top-dressing, are a perennial green. Some of these lands, within the last twenty years, have been ploughed to make them *better* by a rotation of crops. They generally produced abundantly for two or three years, and after seeding with grass, yielded heavy crops of hay for about two years, and would then, notwithstanding top-dressing, begin to run out, as it is termed in New-England, so as to make it necessary in a few years to plough again, and when ploughed again, did not produce half the amount that followed the first ploughing. I am aware that the lands might have been preserved in good heart by *expensive* manuring; still I am of an opinion, that they were *essentially injured* by destroying the native rich sward.

I had charge and was a proprietor of a large manufacturing establishment in Connecticut, erected during the late war, connected with a farm of about ninety acres. A piece of ground of about four acres, near the river, above high water, but where the bed of the stream, probably at some former period, had run, had never been ploughed to the knowledge of any of the neighbors, but had been for years pastured and mowed. Indeed, it was so full of large stones as to discourage the use of the plough, besides it was considered leachy land, that was almost useless to manure. I examined the soil, and found it from two to four feet, sand, coarse gravel, stones of all sizes, to four feet diameter, interspersed with alluvial deposite. As it was convenient to irrigate it from the pond, I determined to make an experiment upon it. The native grass was principally white clover and spear grass, but was intermingled with brakes, small bushes, vines and weeds, and did not usually yield more than half to three-quarters of a ton of second quality of hay to the acre. By blasting and digging, all the stones from the surface were removed and placed in heavy walls, the holes were filled with decayed chips and wash from the roads; the ground cleared on the surface, without breaking the old sward more than was necessary. I was then advised to plough, as the only way to subdue it and get it into good grass. I determined not to disturb any more of the native sward, though quite thin and broken. We had prepared about 200 loads of good compost, which was carted and spread upon it; then sowed white and red clover and timothy seed freely, had it raked over, and all the little stones and sticks removed. The water was turned on the next spring when needed; a very large crop of grass, intermingled with some weeds, was ready to cut by the last of June. By the 1st September a great crop of rowen was produced. The following year it produced principally spear grass, mingled with clover and timothy, of superior quality and a great burden, estimated at more than three tons per acre, and the second crop full one and a half. By the middle of October, the grass was six inches in height and very thick; no creature was allowed to graze in the field. The next season it was top-dressed with about twenty loads of compost to the acre: the crops were equal, or superior, to the previous year; the ground was covered with a firm sward, and had a rich appearance. We reclaimed about four acres more in the same manner, on a moist and richer soil, and with *equal success,* without the advantage of irrigation, part of which had been considered so worthless, that it was not fenced, but left in commons. From about eight acres we calculated annually to obtain more than thirty tons of first quality of hay at two crops, and one year the estimation was as high as thirty-four tons. These meadows did not depreciate with a top-

dressing biennially, but they were never fed, as I have been long satisfied that it is difficult to have good meadow and pasture on the same land annually. From the accounts of the expenses, estimating the value of the land before it was improved, preparing the ground, including the walls, about four feet wide at the bottom, five and a half feet high, capped with flat stones thirty inches wide, value of manure, seeds, cultivation, &c. the product netted more than twelve per cent per annum on the whole investment, the hay being mostly sold to inhabitants attached to the manufactory. When we sold the premises in 1824, these meadows were considered equal, if not superior, to any in the county.

Some other experiments I made, which perhaps I may hereafter communicate, should you judge this worth a place in the Cultivator.

I was more successful in farming in Connecticut than I have been *thus far* in New-Jersey.

I am, with much esteem, yours respectfully,

D. L. DODGE.

The Importance of Manufactures to Agriculture.

There is probably no branch of science of more importance to a nation, than political economy, inasmuch as "the physical well-being of a community is an indispensable basis for every thing else. Without it all the rest is fearfully insecure." The causes affecting the welfare and prosperity of a people, are as immutable as are those controlling the planetary system. We have, it is true, the power of violating the causes which contribute to the well-being of nations, but never with impunity; for so sure as we are found transgressing them, so sure shall we be punished for our temerity.

There are three sources of wealth, agriculture, manufactures and commerce. Agriculture is the most important, as it employs a much greater amount of labor than both the others, and as it is the foundation on which the others are supported. Manufactures is the second greatest source of wealth, and commerce is the lowest on the scale; yet on commercial enterprise both the others are sustained and made profitable.

Our farmers appear to be generally uninformed as to the causes affecting their prosperity. It may appear presumptuous in an obscure individual, to pretend to superior knowledge on this subject, yet, if my positions shall carry conviction to all who will attentively consider them, I shall not have presented them in vain.

The farmer makes his returns annually, and on the prices of his products his profits must depend. He can sustain himself under moderate profits; but the prices at which he sells his products must be sufficient to sustain his family, and keep his tools and cattle in good order, or he sinks. To understand, therefore, the causes affecting the prices of agricultural products, must be to him all-important. The object of this short essay is to make this clear to the commonest understanding.

We will suppose our country to contain three millions of families; that two millions are employed in agriculture, and one million in the other two branches of industry. It is not pretended that this division is statistically correct, nor is it necessary it should be, as the reasoning from it will be found equally conclusive, whatever may be the relative proportions. We have then two millions of producers to one million of consumers. We will take it for granted also, that the two millions of producers can at all times furnish sufficient surplus products to supply all the wants of the one million of consumers; and that this relative proportion of consumers to producers, is necessary to sustain agricultural products at remunerating prices. Now, it is self-evident, that we cannot change the relative proportion of consumers and producers, without causing a change in the price of agricultural products. If the proportion of consumers be increased, the price of products will necessarily rise: on the other hand, if the proportion of producers be increased, prices must as surely be lowered.

We can now understand, why the agricultural products of this country have been gradually increasing in value for the last five or six years. Our manufactures were in so flourishing a condition, that new ones were starting up in every direction, and our commerce had increased with equal rapidity. These extensions drew off from agriculture a portion of her producers, and greatly increased the proportion of consumers. Add to this, the tens of thousands that were employed on canals, rail-roads, public buildings, &c. and it will be easily estimated, that our consumers had increased until they were almost too great for the means of supply, thereby increasing rapidly the prices of every article of agricultural consumption.

Within a year past a radical change has passed over the face of our country, and the result must necessarily so lower the value of agricultural products, as to bring ruin home to thousands of our farmers. I wish I could predict better results, but as things are now progressing, I can see no opening by which our farmers can escape from more depressing prices than they have experienced since we have been an independent people. Manufactures and commerce are so prostrated, that hundreds of thousands of workmen have been driven from those employments, and are fast settling on land as farmers, or employed as workmen in tilling the soil. The producers will so outnumber the consumers, that ruinous prices must necessarily follow.

It is not my province to show by what mismanagement this state of things has been produced. I wish merely to register the prediction, that our farmers will suffer severely in the end, and to show them, that manufactures and commerce can never be much depressed, without bringing ruin home to the agriculturist. They are usually the last to suffer from bad times, but their sufferings are generally more protracted when they come. I see no remedy for the evil, so long as the majority of our citizens can be gulled into believing, that the vital interests of our country are mere foot-balls for designing demagogues to kick about at their pleasure. Sudden changes are as deleterious to the political system as they are to the physical, and our citizens will have to learn by sore experience, for nothing short of personal suffering will open their eyes, that prating demagogues, however great their gift of gab, are totally incapable of wielding successfully the complicated affairs of a nation.

Commerce will soon revive from the fatal blow that has prostrated it, but our manufactures cannot be so easily resuscitated. The whole civilized world is interested in sustaining our commerce, and great efforts will be made by the manufacturers and capitalists of Europe to supply this, their best market, with their manufactures and raw material. If our own merchants cannot sustain themselves, foreign agents, with foreign capital, will fill our marts of commerce, and the profits our merchants have heretofore made, will go into the pockets of foreigners, to add to their already overgrown capital. The same foreign influence that will be employed to resuscitate our commerce, will be exerted to keep down our manufactures. It is the well known policy of Great Britain to prevent the manufactures of any other country from succeeding. It is her interest, and her policy and interest have never been opposed to each other. Our commercial cities are already crowded with foreign agents, and the late prostration of commerce will add greatly to their number. It is well known, that every foreign agent is openly opposed to our manufactures, and it is to be expected they will continue, as they always have done, to lend their whole force and interest to break them down. They consider that every article manufactured in America, prevents their selling just so much of English manufacture.

The interest of our agriculturists is deeply involved in the question: shall our manufactures be prostrated to please foreign agents, and for the benefit of foreign capitalists, or not? The time has arrived when this question has to be decided by the voice of our citizens. Our marts of commerce may answer in the affirmative; our cotton planters, from every appearannce, will lend their assistance to prostrate them; but what are the feelings of the farmers of the free states towards our factories!! will they support them, or will they look coolly on and permit them to be destroyed? W. P.

Beet Sugar.

In the introduction of new branches of industry, which promise to realize a large profit, we are prone to catch at every suggestion, however extravagant, which promises to administer to our cupidity; while those who are interested in deceiving us, take care to keep up the deception till their own turns have been served. These remarks have a particular reference to the silk and beet sugar business. The excitement in relation to both has been great—we think unreasonably so. The following criticism upon the letters of Mr. Glass, which are from a gentleman who spent the year 1836 in France and Germany, and who professes to be familiar with the process—the best process, of producing beet sugar, cannot but have a salutary effect in correcting any extravagant notions which the letters of Mr. Glass may have produced.

CRITICISM ON MR. GLASS'S LETTERS.

SIR,—Having paid particular attention to the manufacture of sugar from the beet in France, I think it proper to mention to the public some errors which appear in the account of cost and profit, given by Mr. J. W. Glass, of Clapton, London, in his correspondence with Mr. Dey, of New-York, and by Mr. Dey communicated to you.

The cost of manufacturing in France is stated to be *just equal* to the cost of material, or rather that proportion of expense for manufacturing is set down as a very *liberal* allowance. Now in fact, the cost of manufacturing on any French plan is *twice* as much as that of the material. Thus, adopting Mr. Glass's estimate of the value of a ton of beets, viz. 15s. ($3.33,) it will result that the expense of converting the same into sugar will be, not 30s. ($6.66,) as he states, but 45s. ($9.99.)

Again: Mr. Glass says that the molasses of the beet is worth 2d. (1 cent and 8⅓ mills,) per pound.

The highest market price of the beet molasses in France is about 5 mills a pound, but the more common price is only 2½ to 3 mills, or 2 to 3 cents a gallon.

I do not mean to express any opinion of the merits of the new method of extracting the saccharine from beets, which is the subject of Mr. Glass's correspondence. This would be rash in the absence of all information touching the apparatus and processes by which this is effected. I merely wish to show by the above examples of error, that the evidence which Mr. Glass gives to show the excellence and advantages of the new method, is not to be relied upon. It is one thing to make an array of figures, and it is another thing to have them based on facts, and on a diligent and faithful induction from facts. And here I may observe, that no evidence of impartial, practical and scientific men is adduced, to show that any such advantageous result as Mr. Glass speaks of. In a matter of so much importance as an improvement for which the inventor demands half a million of dollars, we naturally expect other proof than mere assertion, either of the supposed inventor, or of those who recommend his improvement, or negotiate for the sale of his patent.

A new illustration of the remarkable looseness of the information may be perceived in Mr. Glass's last letter, dated Dec. 8, 1837. He quotes the price of sugar in New-Orleans at 8½ to 9 cents. That price is in fact only 4¾ to 6 cents.

My object, sir, is not at all to prejudice the public against the alleged improvement; on the contrary, I would welcome it with pleasure. I only wish that the public may be on their guard against error or deception in this matter, because I am persuaded, that nothing will tend so much to retard the introduction of this new and interesting industry, as a hasty entertainment of unsound theories on the subject. Lately in France, a man of the name of Stolle, belonging to Strasburg, announced that he had discovered a method, by which, in eight hours, good white crystallized sugar could be obtained from the beet. The news flew with rapidity over France, Germany, Great Britain and the United States. If you look at the files of any paper for 1837, you will see the proof of what I say. But what was the amount of this affair? The pretended inventor was called upon to verify his pretensions in the presence of impartial persons. He appeared before them, and exhibited a quantity of liquor, which he called syrup of the beet root; he then retired, and when the time, which he had assigned for the operation, was expired, he reappeared with a specimen of fine sugar, which he *asserted* that he had made from the said liquor. This exploded Mr. Stolle's pretensions, and he passed away. Such may not be the fate of this English discoverer; I certainly hope that it may not, but for one I wait for proof. Yours,

VIATOR.

A Proposition, to facilitate agricultural improvement.

Lake C. H. Ia. 4th March, 1838.

J. BUEL,—Dear Sir,—WHAT CAN, WHAT MUST, WHAT SHALL WE DO, to elevate the standing of the cultivators of the soil! There is "something rotten in Denmark," that needs ALL the energy of ALL the friends of agriculture, to eradicate from the community. A false pride pervades the land, and a false estimate is placed upon the value of that class of community, who are the very creators of, not only all wealth, but are the very basis and only foundation of all real wealth. What shall we do to bring about that happy state of society, that once pervaded the Roman empire, when he who cultivated the soil took the first rank among all trades and occupations! One of the very best things that the friends of this whole country can do, is to make the science of agriculture take that rank that shall induce merchants and professional men to seek to make *their* sons farmers, instead of that worst of all manias that now pervades the farming community, and which induces the annual ruin of thousands of young men, by seeking to be what nature never intended them for.

"Willie is so weakly we must make a doctor of him." "And John has such a *faculty* for trade, that his father intends to set him up. Besides you know, since he came home from school, he can't bear to go to work on the farm; and you know it 'ant so genteel as a merchant." These expressions and sentiments must be weeded out of every farmer's family. And he who can devise how it shall be done, how to change the public sentiment, so as to make the farmer and

the farmer's wife and sons and daughters proud of being such, will be more deserving of the thanks of his country, than he who discovers how to destroy the grain-worm; for of a truth, this is a worm that is eating out the very vitals of community. It is the very cause of all the importations of wheat into the United States, and which have blotted our fair name as an industrious, agricultural nation. The commercial and professional part of society is overburthened with useless drones. The agricultural community are borne down with a consciousness that they are neglected by legislatures, and despised by the butterflies who flutter over them in British broadcloth, consuming the fruits of the sweat of their brows. And the mania that induces farmers to seek to ruin their offspring by seeking to make them *genteel*, unless soon counteracted, will do more to dissolve this Union, than high tariff and abolition united. An indolent mode of life, or a false pride, that makes a man ashamed to earn his own living with his own hands, is a fountain that will spread more seeds of corruption through the body politic, than all others.

What then shall we do? For do we can—Do we must, and let you and I say, do we will. Every thing must have a beginning. Suppose then that we begin with an endeavor to form an

AMERICAN SOCIETY OF AGRICULTURE,

The leading principle of which shall be to elevate the character and standing of the cultivators of the American soil; and whose members shall be pledged to the promotion of domestic industry, and particularly the growth of American wool and silk, by wearing manufactures of such; and to the promotion of agricultural schools, and the establishment and gratuitous circulation of agricultural papers.

And now, you being agreed with me, that a great good may be accomplished by such a society, the branches of which shall extend into every county of the Union, will you take it upon yourself to effect the first organization? Will you draft a constitution and nominate some gentleman who will act as the first president? (I suggest the Hon. H. L. Ellsworth, Washington.) Make every editor of an agricultural paper, and such others as you think proper, vice-presidents. A treasurer should be appointed to receive *voluntary* contributions towards forming a fund to defray necessary expenses of printing, &c. and sending abroad agricultural publications, and printing a splendid certificate of membership, which fathers would exultingly show their children as a mark of honor. A corresponding secretary should be appointed in every county and principal town, who would be active in enlisting members, and communicating a mass of information to the principal secretary, &c. The grand object would be, to enlist such a mass of influential men in the society, that farming would become popular and fashionable, so that parents would no longer seek to get their children into a more fashionable or "more genteel employment."

A great good could also be accomplished by annual meetings of such a society. The delegates from every state, not only bringing together a vast amount of useful information, but rare and valuable seeds from every part of the Union for mutual exchange, and also curious specimens of vegetable and mineral products, which in time would form a most curious and unique cabinet of natural curiosities.

If the project is not visionary—if it can be carried into effect, do not let it rest. Your standing and influence will give a weight to the matter, that I, an individual but little known, cannot command. But my humble exertions and small means will be freely given to roll the ball ahead, when once started.

I think you can associate twenty gentlemen at least, with you in Albany, who will be willing to lend the influence of their names and form a nucleus, around which to form this great national bond of union and usefulness.

And if nothing else can be done, you can publish this communication, with an earnest request, that every patron of the Cultivator would say to himself, something can, something must, something shall be done, to raise the character and standing of the whole agricultural community, and I will begin in my own family. I will teach my children that no other occupation is so profitable, so honorable, or so "genteel," as that of a farmer.

I do not often write so lengthy, but the manner in which you have honored my several communications, has led me to hope that I may still be useful, and I humbly hope withal, interesting to some of my agricultural friends.

I remain, most respectfully, your friend,
SOLON ROBINSON.

REMARK.—Mr. Robinson's proposition meets our hearty approbation; and should it be favorably responded to by our cotemporaries who conduct agricultural journals, and whose opinions upon the subject we respectfully solicit,—we shall give it our cordial support,—and devise some means, if others do not do it, to organize an association, "TO ELEVATE THE CHARACTER AND STANDING OF THE CULTIVATORS OF THE AMERICAN SOIL."—*Cond. Cult.*

Conversion of Starch into Sugar.

Easton, Pa. March 20th, 1838.

Mr. J. BUEL,—Dear Sir,—If not too late to reply to the query made by Mr. Edwards, concerning the conversion of starch into sugar, you may publish the following answer:

Starch of wheat is converted into sugar by boiling it for several hours in a dilute solution of sulphuric acid, (oil of vitriol.) The acid should be diluted with twelve times its weight of water, and starch added in the proportion of 1-40th of the weight of the solution employed. Potato starch, concerning which the information was particularly desired, yields sugar much sooner, even in two or three hours. The proportions are 1 to 2 parts of acid, 400 water, and 100 potato starch. The part performed by the acid is not precisely understood, as it suffers no diminution, and causes no evolution of gas. The only necessary change, however, seems to be the addition of the elements of water to starch, in order to make the conversion, as will be seen by referring to the analysis of the two substances; and this is produced by the sulphuric acid in some unknown away.

Saussure stated, that more sugar was procured than the starch employed, in the proportion of 110.14 to 100, though this has since been denied.

As the acid remains in the liquid unchanged, it is removed by adding powdered chalk, the whole filtered, and the sugar then obtained by evaporation.

In both cases referred to above, the sugar obtained is crystallizable, and resembles the saccharine matter obtained from the grape.

Starch is converted into sugar spontaneously in the germination of grain in malting, and likewise by frost; hence the sweetness of a frozen potato, apple and some other substances.

Respectfully yours,
TRAILL GREEN,
Prof. of Chemistry, La Fayette College, Easton, Pa.

Isabella Grape Vines—Wine, &c.

SIR,—The cultivation of grape vines and making of wine is getting to be so well understood throughout the United States, through the medium of our excellent agricultural periodicals, that what I am about to write, is probably already known to some of your readers; yet the repetition of interesting facts is often of much benefit, and the results of experience in these matters can scarcely be too often repeated.

The very numerous attempts to raise grapes from foreign vines in the *open air*, have resulted in disappointment. The late Mr. Parmentier, of Brooklyn, Long-Island, devoted much labor and expense on foreign vines, to very little purpose. Mr. Loubat, also near Brooklyn, planted a large vineyard, and for some years flattered himself with *hopes*, which resulted in loss or disappointment. In some few instances in Brooklyn and New-York, where the vines were protected by surrounding buildings, the Chasselas and other foreign varieties yielded well, thereby only demonstrating that such fruit *can be* obtained, if cultivators will be at the trouble of erecting proper houses for the purpose.

The Isabella grape vine is supposed to be a native of North Carolina. It first obtained its well-deserved notoriety at Brooklyn, in the garden of George Gibbs, Esq. now of St. Augustine, Florida; and derived its new name from his lady, Mrs. Isabella Gibbs, who was instrumental in obtaining it from the south for her garden. The original parent of all the Isabella vines is now to be seen in the garden of Zachariah Lewis, Esq. on Brooklyn Heights. This favorite vine has spread itself throughout the northern states of the Union, in Canada, and has been imported into France, and drawn forth the favorable notice of the French cultivators. Almost every garden and dooryard in Brooklyn and New-York can boast of its prolific vine, always yielding abundance to the careful cultivator.

In the year 1827, I set out, at a small place near Brooklyn, the cuttings for about 300 Isabella vines, and 50 foreign vines from France and Germany. By reason of careless cultivation from bad tenants, they did not come into bearing until 1831, in which year I was able to exhibit five kinds of very fine grapes at the horticultural exhibition in New-York. I also sent large quantities to the market, and made about fifty gallons of wine, merely as an experiment, as I supposed myself to be the first who had attempted to make wine of this grape. This wine was of two kinds, made in October, 1831, and in the April following was put into bottles, and one bottle of each kind sent to about fifty persons in different parts, who were supposed to feel an interest in the matter. One kind was made of pure juice, to which two pounds of sugar to each gallon was added. The other kind was composed of one-third water to two-thirds juice—three pounds of sugar to each gallon—one gallon of brandy to a cask of nineteen gallons. Some of this wine attained five years, and was pronounced very excellent.

In the year 1832, my little vineyard bore very abundantly, and I made, in October of that year, eight barrels of wine. It was made in a variety of modes, to test the quality of the grape, and did not all prove good; but far the greater part was very excellent, and improved with age.

I will now proceed to describe my mode of planting and cultivating the vine, and of making wine.

The cuttings intended for propagation are of any well ripened wood of the *last year's* growth, embracing three or more joints or buds. It is preferred that it should be connected at the lower joint with some small part of the old wood of the previous year. These cuttings are taken from the parent vine at any time between the first of November and first of March, and immediately buried in the earth, or put under earth in the cellar; or sometimes the ends are put in a box or basket with earth, and set in a green-house, and water occasionally sprinkled on them. In the spring, if they are not placed in their permanent locations, they may be carefully set out in the garden, at one foot apart every way, the upper bud being just even with the surface of the earth. If the season is dry, they will require to be watered several times to insure their growth. They will grow a foot or more in length the first season. In the following spring they may be transplanted to their permanent places, around buildings, fences, trees, and arbors. I trim the new sprout down to three or four buds, intending that *two only* shall be allowed to grow, and these to be trained off from the root in different directions, according to the circumstances of your trellis, or supporter. My vineyard was planted in rows, eight feet apart, and vines eight feet in the rows; but after a few years the trellis became so burdened, that I took up and removed one-half the vines, and left them sixteen feet apart in the rows. Each vine, therefore, had sixteen feet of trellis, being eight feet on each side of the root. The two main branches were tied to the lower rail of the trellis, and the lateral branches tied to the rails above.

My trellis was composed of four lath, open at the top, as I supposed it was necessary that the sun and air should have a good circulation among the vines; but I am now convinced that a top surface, as afforded by an arbor, is necessary. The great exuberance of the vine causes the new shoots to run up into the air above the trellis, and the wind will prostrate and break them, unless they have a flat arbor to rest upon. The fruit hangs with great weight on the branches, which are often broken unless they can rest on an arbor, or are well tied to the upright supporters.

As there are *four* distinct *prunings*, or trimmings, required in properly cultivating the Isabella vine, I will now describe them; merely remarking, that although the vine will give fruit when some of these trimmings are neglected, yet no cultivator has a right to expect *good fruit* without bestowing the requisite time and attention to these prunings.

First, the winter pruning. This is best done in February or March, provided the vines are not frozen; but may be done at any time between October and April. It consists in reducing the old wood according to the extent of your trellis, and the age of the vine, and strength of the root. All unripe wood is cleared off—old wood thinned out, and ripe wood of the *last* year's growth shortened down to two or three buds, *except* such runners as shall be selected to cover the trellis. Much depends on judgment in this trimming. It is difficult to describe precise rules. Those who love the grape should *cut boldly*, and acquire knowledge by experience and close observation. Every branch should at this pruning be strongly tied to the trellis.

The *second* prunning, or budding, takes place about the 10th of May. The buds have then thrown out their branches an inch or two, and generally two or three branches at every bud, or joint. These must all be reduced to one shoot, or branch, always leaving the stoutest or best shoot. They are disengaged with a slight touch, and a short time would suffice for many vines.

The *third* pruning takes place about the middle of June, and sometimes earlier, and is best performed with a pair of shears, or scissors. At this time I cut off what are called *laterals*—a branch growing out of the green wood on the side *opposite* to the fruit. These laterals may be broken or cut off quite down to the main branch at any time during the season; but it is better to remove them early, before they have acquired size and strength at the expense of the rest of the vine.

The *fourth* and last pruning is called *stopping*, or *shortening*, and is done with a shears or a knife. It should be done about the middle of July, when the fruit has attained about half its growth. I then shorten all the branches having fruit on them, (except those retained for permanent runners,) by cutting them at two or three joints forward of the fruit. This

is a heavy and essential pruning, and divests the vine of much green wood and leaves, and is considered important to the development and ripening of the fruit. I would, however, particularly caution the operator against at any time removing the *leaves* of the vine, except such as are attached to the laterals and shortenings, and come away with them. The leaves are vitally important to the ripening of the fruit, which is always the best in the deepest shade. Such fruit as by accident becomes exposed to the sun, is sure to be very inferior and sour.

About the 8th of June, while the vine is in flower, and throwing its peculiar and delicious perfume all around, its great enemy, the *rose-bug*, makes its appearance, and feeds with voracity on the sweet and delicate blossom. In a few days after their first appearance, thousands are seen, carrying destruction throughout the vineyard. The best remedy I could ever devise, is to go among the vines early in the morning, before the sun has warmed them into activity, and they are then easily made to fall into the hand or on the ground, and may be crushed and destroyed. A few mornings spent in this way will clear the vineyard, as they are a short-lived enemy.

In the latter part of July, the *blight* or *rot* takes place where the Isabella vines are cultivated in fields, but it is seldom seen among those cultivated in cities. Great quantities of fruit will become brown, and sometimes black, and fall off. It is not easy to account for this destruction, which is seen as much on the high as on the low vines, and no less on fruit exposed to the sun, than on that in the shade. As an experiment, I discharged with a syringe, lime-water, sulphur-water, and soap-suds upon them, and also sifted dry sulphur on the fruit, but without any sensible effect. I feared I should lose all my grapes, but, to my surprise, I had a great crop, notwithstanding the rot. I have since supposed it might arise from the exuberance of the vine, which, like the peach and apple tree, may perhaps thus disburden itself of a portion of its fruit; but even on this principle it is difficult to account for its non-appearance in cities, where the quantities of pure fruit are quite astonishing.

I have observed in the cities, that spiders and caterpillars are in some degree destructive to the green fruit. Spiders will get to the centre of the cluster, and cause the fruit to fall in single grapes, but the caterpillar attacks *the stem*, and the whole green cluster falls to the ground.

I have in a few instances trained the vines upon large apple trees, and the grapes were abundant among the apples; but I do not think this mode is to be recommended where other supports can be had. The fruit was inferior.

In the city of Brooklyn, and among high buildings, my vines have not failed to produce abundantly *every season*, during the last fourteen year. This is an interesting fact to all who cultivate the grape. At my vineyard in the country, they have declined very much, which I attribute to the neglect and ignorance of the tenants on the place. Even in the country they are much better around the buildings than in the open fields. There are from three to five clusters on every fruit-bearing branch. I have in a few instances seen six. The extremities of the vine generally produce the best fruit, and there is often much difference in the quality of the fruit on the same vine. They may be trained a great distance over large arbors, and on the roofs and around the upper windows of our high houses. New branches will sometimes grow from twenty to thirty feet in one season.

The vine is sometimes propagated by *layers*, which consists in bending down the branch into a channel dug in the earth, and burying it at a proper depth, in a curving line, with the end above the earth. Roots will start plentifully from the part in the earth, and when it is well rooted may be cut from the parent vine and transplanted. If proper care is taken, the cuttings as well as roots may be sent a great distance. I sent a quantity of cuttings, packed in moist sods in a box, via New-Orleans to Arkansas, and had the satisfaction to learn that they were all alive on their arrival, and had been successfully planted out.

In March, 1832, I sold ten thousand cuttings to William Underhill, of Teller's Point, near Sing-Sing, N. Y. I have never visited his vineyard, but understand he is a successful cultivator.

Nothing is lost in a vineyard, as the green trimmings in summer are good food for cattle, and winter trimmings, when not required for propagation, make good fuel.

OF WINE.

Although I was successful in making some good wine, yet a portion was spoiled, and I do not flatter myself that I know much about it. An excellent little book, published by Mr. Adlum, of Georgetown, who was a great cultivator of grapes and manufacturer of wine, was my best guide in wine-making. I would respectfully advise such as wish information on this subject, to obtain it, and follow the rules there laid down. My experience, however, may be of some service, and I cheerfully give it.

The grapes were gathered and thrown into tubs, without breaking the clusters, or separating the ripe from the unripe. They were broken by a common pounder, and merely cracking the skin is sufficient, and care should be taken that the seeds be not broken. The *murk* or *pomace* is thrown into a *vat*, which is covered with one or more blankets, to confine the heat and hasten fermentation. A portion is sometimes warmed and added to the mass, to give it a start. The pomace rises on the top, and the whole will continue to rise and ferment upwards for four or five days. When it begins to sink, the fine liquor, as clear as oil, may be drawn by a tap from near the bottom off the vat, as long as it will run clear. This makes the *best wine*. The pomace is then pressed in any convenient mode, and all the juice extracted. The liquor is then called *must*, and in this state it is when any addition may be made, such as sugar or brandy. Nothing will incorporate well unless added before fermentation. I added in different casks from one to three pounds of sugar per gallon; but I would advise the adding of three pounds per gallon in all cases, and I am not certain that a less quantity will preserve the wine from running into the acetous fermentation. If properly made the wine does not require brandy, nor any other spirit, and is much better without it.

After the sugar is added in due proportion to the must, it is put into casks in a moderately cool place, and just filled to the open bung, and allowed while fermenting to overflow. It will work briskly for a month or more, and when it sinks in the cask, must be filled up, so as to continue the overflow. It is best to *stop the fermentation* before it quite subsides, in order to preserve the fine aroma of the wine; and this is done by repeated *rackings*, or drawing off into casks previously smoked with sulphur, by burning in them rags dipped in melted brimstone. If any particular flavor is desired to be communicated *artificially*, it must be done while the must is in the early stages of fermentation. It will probably continue to ferment after this first sulphuring and racking; and it may then be fined, or clarified. Many substances may be employed in this. Whites of eggs—milk and sand—fish-glue, sometimes called isinglass, may be stirred into the wine, which may be racked off in a week or ten days afterwards. At every racking a quantity of sediment is removed from the bottoms of the casks, and these rackings and finings must be continued until the wine is perfectly pure. I commenced my wine-making in October, and considered it fit for bottling in the March following, when it was put into bottles, demijohns, and tight casks.

Even when *new*, the wine is exceedingly good and palatable, and diffuses an inward glow, grateful, cheering and healthful. The taste and aroma are different from any wine I have ever known, and I cannot compare it with any.

I ascertained that a measured bushel of grapes, as they came from the vines in clusters, weighed thirty-eight pounds. I also weighed 100 pounds of grapes and crushed them, and obtained a little more than nine gallons of juice; it thus requires eleven or twelve pounds of grapes for each gallon of wine.

The location of my vineyard being considered unhealthy, I have given it no personal attention since 1832; but many persons in and about Brooklyn have made good wine from the Isabella grape since that time; and I do not doubt that others will follow their example, until the Isabella wine shall become a favorite at the tables of our best connoisseurs.

There is much to be learned concerning the cultivation of the vine, and I look to the correspondents of your excellent agricultural journal, for information on this as well as other branches of these interesting pursuits. In this town last season the Isabella grapes did not come to perfection, and were sour and worthless; yet I had excellent grapes from the fine vineyard of my friend, Josiah Dow, Esq. of Brooklyn, which is twenty miles west of this place. I should like to know whether manuring is desirable? what kinds, and to what extent? what protection is best? and whether my mode of trimming is, or is not, well adapted to perpetuate the vine?

In conclusion, I would remark, that the Isabella grapes are *eatable*, and often in the market long before they are *ripe;* and consequently many people are ignorant of their excellence when in *perfection*. I give it the preference to any grape I have ever tasted, and the vine is the greatest bearer I have ever known.

I am, sir, very respectfully, your friend,
ALDEN SPOONER.

Hempstead, Long-Island, Feb. 15, 1838.

Sir,—Will some of your valuable correspondents please to give your readers information respecting those sprouts from the roots of fruit trees, commonly called *suckers?* Should they in all cases be removed? Are they proper for transplanting, and future grafting?

Many years ago one of my young peach trees was injured by mice at the surface of the ground, and was sawed off; but the roots sent up a very thick bushy tree, which was allowed to grow, and has always been the best tree on the place.

Will quince trees bear best as single standards, or in a bushy form? S.

Hempstead, L. I. Feb. 15, 1838.

Remarks of the Conductor.—The sprouts of fruit trees should be carefully extirpated, except one is wanted, as in the case of the peach above noted, to supply the place of a diseased or decayed parent,—or except, from necessity, they are wanted for stocks, to be worked; yet seedlings are decidedly preferable to sprouts for stocks, though the graft and bud will readily take upon the latter. We may make another exception. Choice plums, and sometimes other fruits, grow on their own stocks, i. e. have neither been budded nor grafted. We have the green and yellow gages, St. Catharines, and other plums growing in this way. The sprouts of these are worth preserving, as they produce fruit like the parent. Such trees are produced artificially by layers from worked trees, and also by grafting in the ground, and when the graft has produced its own roots, separating it, with its roots, from the old stock, and replanting it. Every succor takes from the nourishment of the parent. Heading down the peach, at two years old, is recommended as a means of ensuring long life to the tree, and of protecting it from the worm. The quince bears best as a standard.

Bees and Bee House.

Dear Sir,—If you think the following experiments, "the why and wherefore," would give any information on the management of bees, as a disinterested endeavor to benefit those who are inclined to embark in that branch of rural economy, you are at liberty to publish them.

In the spring of 1834 I had erected on a rock that lay near the surface in my garden, a brick house, six feet square on the base, and six and a half feet high, covered with a conical roof; a hollow column stands perpendicular from the chamber and roof, of a conical form, fifteen feet in length, and fourteen inches at the base, which is not only ornamental, but serves as a good ventilator for the colony; a door and entrance on the south side, eighteen by twenty-four inches, secured by a lock. After being ceiled on the sides and above with matched boards, shelves were made on three sides, and a good hive of bees set thereon. When the door was closed, their egress in and out was through a space made by the omission of seven or eight bricks, on the east and south sides. This stock had filled the hive with comb, but did not work on the outside and shelves as I expected; but in the course of the summer sent out two new swarms. As this contrivance did not correspond with their views, they soon made safe their retreat to the woods. Being a little chagrined, but not willing "to give up the ship," so long as there was a prospect of gaining any good, I placed the hive, the following spring, on the outside of the apiary; another swarm came forth in June; no time was lost in putting within the house the new swarm and bush on which they had collected. They made choice of the north-east corner; from the ceiling worked layers of comb down to the first shelves. I soon discovered that these shelves were on the same plan of the bottom board of common hives, securing the bee-moth a good retreat. I therefore had occasion to take down these shelves, and for a substitute put in cross sticks to bear up the comb, which left no chance for an attack by the moth; since then no appearances of their larvæ and web has been discovered.

In the course of the two preceding winters they have spared to me more than fifty pounds of honey in the comb, as white and delicious as any I ever saw, without apparently crossing them in the least.

The advantage gained by this mode of raising honey over the usual practice is, that a large swarm does better than a small one; they gather more honey, and eat less in the winter in proportion to their numbers. Instead of clustering on the outside of the hive in warm weather, they have plenty of room, fresh air, and a cool place to labor. No inconvenience is realized by comb melting down. They can also raise a more powerful defence against their enemies, and are not liable to winter kill, as in common hives. The perspiration of the bees, which congeals on the sides in moderate weather, with the addition of their heat, the ice will melt, and run to the bottom of the hive, and the bees thereby suffocate. Many a valuable swarm is destroyed in this manner. A hive that is exposed to snow, the door is oft times filled, which prevents the admittance of fresh air sufficient to preserve the life of the swarm.

The bee-moth does not often attack a large swarm; and if any, when disengaged from the comb, they drop to the floor and perish. Mice are secluded. Cattle cannot upset them. And finally, as they do not emigrate, no anxiety attends that disagreeable task of hiving them.

The usual practice of destroying the stock in order to obtain their goodly treasure, has been a matter of regret. No branch of rural economy excites the admiration of all classes of people, more than the industrious and instinctive habits of this instructive little insect, connected with the ingenuity it displays in the accurate construction of its domicil, adds to the proof of an *All-wise Power* in the works of animal creation.

I remain, dear sir, yours,
SOLOMON W. JEWETT.

JESSE BUEL.
Weybridge, Vt. April, 1838.

Wheat on a Clover Ley—Peas.

New-Stockbridge, March 12, 1838.

Mr. BUEL:—Sir,—Now. as I have leisure, I will write a few liner, which may be useful to some of your readers. The first is an experiment in ploughing in clover to prepare the ground for a wheat crop.

In 1834, I ploughed a piece of ground for wheat, which had grown corn and buckwheat the previous year. The piece contained three acres and one hundred and forty rods of ground, which was much exhausted, and covered with Canada thistles. I ploughed it three times, and then sowed the wheat, and ploughed in the seed and harrowed it down. The next spring I seeded it with clover, and sowed on plaster. The wheat was plump, and yielded sixteen bushels to the acre. The next spring I gave it another dressing of plaster; the clover grew very luxuriant; I ploughed it in just as it was beginning to blossom. I worked the ground the same as I did the naked fallow, except that I passed the roller over the last crop in the fall and again in the spring. The last crop I harvested the past season; it was very much injured by the rust. I am confident that it destroyed one-third of the crop, notwithstanding I got one hundred and fourteen bushels of wheat, which is about twenty-nine bushels to the acre, by weight. I can assign no reason for this extraordinary difference, but the plaster and clover.

Now a few words with respect to the pea crop. I am fully convinced, by close observation and experiment, that farmers generally sow them too thick.

In 1835, I sowed eight bushels of peas on four and one half acres of ground, and raised one hundred and seventy-three bushels.

In 1836, I sowed two bushels to the acre, with the exception of one half acre, which I was induced to sow at the rate of three bushels to the acre, to see if the result would confirm my previous experience. I found when I came to harvest them, that those which were sown thin were remarkably well podded and a very abundant crop, and that the half acre which was sown thick had only a few small pods on the ends of the vines, and were still in blossom. A neighbor of mine has been in the practice of sowing about four bushels to the acre, and has commonly got from ten to fourteen bushels. The last season, I persuaded him to try two bushels; he accordingly sowed four bushels on two acres, and he has told me that he raised over eighty bushels from the two acres. From these circumstances, it is obvious to me, that where the ground is in good condition and well pulverized, they should not be sown more than two bushels to the acre; and if the ground is very rich a less quantity would be preferable. When sown thick they obstruct the circulation of the air, and exclude the heat from the ground, and become rotten or mildewed at the bottom. They should be harvested while the end of the vine is green, as they are valuable for fodder. All kinds of farm stock eat them greedily; sheep and colts are particularly fond of them.

SIDNEY SPRING.

To prevent the ravages of the Cut-worm.

Dutchess county, March, 1838.

Mr. J. BUEL,—Dear Sir,—Many things have been prescribed to prevent the grub or cut-worm from destroying Indian corn in its infancy; most, if not all of them, I believe to be ineffectual or inert, and some of them pernicious to the growth of corn. And as the season when the grub commits its ravages is near at hand, an effectual means to prevent its mischief I believe might be of vast importance to the agricultural part of community.

Believing myself to be in possession of a knowledge of means that will completely prevent the cut-worm from destroying young corn, I shall endeavor to communicate the same to you, and shall consider myself fully compensated, without any reward from church or state, if they shall prove serviceable to the farming interest.

The remedy consists simply in feeding the grub. Many farmers are in the habit of badly ploughing their corn ground for this purpose; for bad ploughing leaves much grass for the grub to live on. But the practice of bad ploughing vastly increases the labor, and consequently the expense of raising Indian corn. The better practice is to plough well at first, and afterwards to apply the remedy.

The grub is not a dainty feeder, and will eat almost any green herbage. The best I have found to be the following: young elder sprouts and their leaves, milk weed, clover, mullein, and almost any green vegetable that happens to be at hand. My time and mode of applying them, is to apply them two or three days before the young corn makes its appearance through the ground, in compact handfulls in every fifth row, between every fifth and sixth hill, pressing the handfulls, when dropped to the ground, with a tread of the foot. The grubs, if numerous, will soon collect under these handfulls, in dozens, scores, and hundreds, and there remain for shelter and food as long as they find good accommodations, which will last for ten days or more. In the mean time it will be an easy matter to destroy them with a sharp instrument, going from handfull to handfull, along the rows in which they are deposited. I have in this way killed more than two hundred under a handfull, and thus saved my corn. Handfulls of fresh herbage must be reapplied if necessary.

The remedy may appear to many at first notice almost as bad as the evil; but I believe that a smart man will gather and apply the remedy to more than five acres in a day, and to destroy the grubs when collected is an easy matter. At all events, I believe, after a fair trial, that the remedy is the cheapest and most effectual that can be applied; and depend upon it, the remedy is no quack prescription, for it has its foundation in the animal appetite and disposition, that animal nature can be more readily coaxed than driven.

Many farmers in this county have procured spring wheat to sow; and those that I have talked with, intend sowing it as early as possible. I tell them, as the grain-worm made its appearance in our county last season, there is good reason to believe that sowing about the 20th of May would be worthy of trial, so as to prevent the fly from depositing its eggs in the soft grain, as spring wheat, when sown about the 20th of May, does not come in head until after the disappearance of the fly.*

I bought some spring wheat of a man that procured it in Oneida county, and he told me that the fairest and best spring wheat he saw there, was sown as late as the 4th of June. Can this be? What are the advantages and disadvantages of late sowing spring wheat, and how late will it do to sow it in Dutchess county?

I tried your method of steeping seed corn in water near the boiling point; but I found that was cooking it too soon, for not more than one-fourth of it came up, and being under the necessity of replanting, I found the same kind of seed came up to a grain, when planted dry.

Yours, &c.
A SUBSCRIBER.

* So says Mr. J. Buel.

Steaming apparatus—Apple Butter, &c.

New-Bedford, Merc. Co. Pa., March 1, 1838.

DEAR SIR,—I am pleased to have it in my power to communicate to you something at the commencement of each volume of your exceedingly interesting and highly useful periodical. I consider agricultural knowledge (in connection with the sciences which develope its resources) as the basis upon which rests both individual and national prosperity. Whatever some may say in relation to agriculture, that the study of it is menial drudgery, I am bold to assert, that as a science, in all its affinities and relations, it is better calculated to expand the mind and generalize the ideas than any other science that ever engaged the attention of mankind. I might here expatiate, and attempt to show its vast importance to the human family—how from it necessarily flow all our temporal enjoyments and comforts, all our national strength, and whatever elevates the present state of society above the savage condition of mankind; but in the compass of a letter there is not room. Mankind have hitherto been asleep in relation to the immense importance of this subject—but are now, we hope, about to arouse from their torpor, and elevate their standard in agricultural pursuits.

In the September number, volume 2d, we have a cut and picture of an improved hog-pen and steaming apparatus. They are both perhaps very good—they may be excellent—but they are not adapted to the generality of your readers, on account of the expense of their erection. You apprised us of your intention of giving the above cuts and description in a previous number. At the moment of the receipt of the note I was in an advanced state in the construction of a steaming apparatus and hog-pen. I instantly postponed the completion, till I should discover what new ideas and suggestions the communication would contain, that I might avail myself of them, in order to make every thing as perfect as possible; the communication came. I perused it with great interest, and was surprised at finding a remarkable coincidence and similitude between that you describe and the plan I was pursuing. The steaming apparatus, however, cut me short, and caused me to defer the finishing of it one whole year; however well it may be adapted to men of capital, to a large proportion of your subscribers, and in some particular locations, the thing is nearly impossible. After deferring it as above stated, I recommenced work in order to finish it. On the resumption of the work, I was puzzling myself in thinking whether this plan or that would succeed best, when fortunately a number of the Cultivator arrived, containing an account of precisely such an one as I was erecting, by Mr. Loomis. Here I will mention the great advantage individuals receive from publications which have for their object the promotion of interests compatible with their own, when the mind and genius of thousands are at work for the furtherance of objects of great importance, and the result of their experience made known in these publications. Improvements must progress in their line, because they mutually stimulate and assist each other, confirm kindred associations of mind, prevent experimental blunders, and retrieve from oblivion discoveries which had all but attained their climax, and which, but for the aid of a kindred spirit arriving opportunely, had been lost forever. Well, the communication of Mr. Loomis arrived; was read with great interest, and gave me confidence. The introduction of the false bottom and the setting the box right over the kettle, were the suggestions I availed myself of, as I had turned the steam by an elbow clear of the furnace: my boiler is a twenty gallon kettle, first set according to your direction, the present position of which is the result of three several experiments, and answers very well. My kettle lid is made in the first place with inch oak, ploughed and grooved, and covered transversely with two inch plank, well nailed; the tube enters the centre of the lid, and is a little over four inches square inside, and enters the box near one side, which leaves one side of the lid uncovered by the box, for the purpose of introducing water through a large plug hole, by a funnel; one end of the box is a little elevated, making a small angle with the plane of the horizon, that the condensed steam and vapour may run out at the draw end; a close lid covers the box which, in the operation of steaming, is covered with a carpet, an essential requisite. On steaming my second box full, which was apples, I applied my hand to the end of the box, where the condensed steam ran out, in applying it to the tongue, it tasted very sweet; as the process of cooking progressed, the sacharine matter accumulated. I directly constructed a trough, placed the one end in a tub and the other under the box, and collected in the tub a very rich cider; by continuing the fire, I could discharge the whole of the saccharine matter, by leaving nothing but the core and vegetable fibre. We immediately commenced making apple butter and preserves of every kind, and have set apart a barrel for vinegar, which we believe is better than cider from the press; two or three buckets of water thrown over them in the finishing process, washes out the residue of the sugar. This process saves housewives immense trouble in boiling their sweet apples over the fire, and straining and pressing out the juice. The juice runs from the box toward the last of the process as thick as molasses. I prefer this for domestic use above all the other processes ever made.

WM. JOHNSTON.

Evergreens for Shelter and Hedges—Their price, &c.

Judge BUEL,—Dear Sir,—I am desirous of hedging in with a good wide belt of evergreens, the front of one of our farms, lying on the Niagara river. The land was cleared up, previous to my purchasing it, à la Americana, which is to say, every thing living was remorselessly cut down along the whole front, thus leaving the fields completely naked and exposed. My object, therefore, in growing this belt, would be twofold, viz. a fence *impervious* to both *man* and *beast*, and a shelter from the rude winds, that come sweeping down the river, and across from the Canada shore. The belt would require some two or three thousand trees, and I should wish it as complete a representative of the different kinds of evergreens as this latitude would produce, and as could be obtained at a moderate price, delivered on the bank of the Erie canal, six miles below Buffalo.

As to the hedge, I must confess myself in very great doubt in the selection of material. I had thought of the red cedar, but if the objections to this tree, are as likely to be as great in this latitude, as mentioned by Mr. Garnett in the March number of the Cultivator, as taking place in Maryland and Virginia, it would be totally useless to attempt it. Of this, however, in conjunction with your good self, I have great reason to doubt. Evergreens, locust, and thorns grow in this vicinity in very considerable variety, and I have as yet neither seen or heard, of any attack of worms or insects, and particularly solicit information on this point from any of your correspondents, who may lately have visited the cedar forests on the small islands

of Lake Erie, or that grow near Toronto, and other parts of Upper Canada.

Mr. Garnett speaks of the Holley, as "sui-generis in regard to its exemption from disease." Does he mean the Ilex Opaca of Brown's Sylva Americana, and if so, would it flourish well here? The close branches and spinous leaves would make an admirable fence, and there is no doubt, with attention, in our fertile soil, the rapidity of its growth would be greatly accelerated, and its foliage at all seasons retain the brightest green. Yet I have thought of another tree still more beautiful: the flowering rhododendron, (Rhododron maximum,) and known at the south as dwarf Rose Bay, and at the north as dwarf Laurel. As it seeks moisture and shade, I should suppose our climate more congenial to it than any other in the United States, for the thermometer rarely sinks with us to zero, or rises above 75°; and besides, the air is more moist, though less foggy, than the same parallels on the Atlantic. I see no objection, therefore, to first placing a triple row of intermixed evergreens, hemlock, spruce, fir, cedar, &c. then a small space for the line of rhododendrons, then mixed evergreens again, till a sufficient breadth of trees for shelter were planted. Here then would be obtained the great desideratum, fence and shelter, for I know of no other evergreen that will flourish as a thicket in the shade of larger trees.

If no one has yet attempted this rhododendron, I should be pleased to, as also the holley, and as neither grow in our immediate neighborhood, supposing plants out of the question, I would like to know where I could obtain seed, with any directions for sowing and growth. I am told they flourish from the hills of Massachusetts, along the highlands of the Hudson, to the mountains of Carolina; and that autumn is the proper time for gathering.

And while upon the subject of trees, would that my voice might reach and have an influence with those clearing up new lands. No matter how exposed the situation may be to the rude blasts of winter, or the scorching rays of summer, in goes the ruthless axe on the front line, and never ceases its remorseless swing, till the whole land is denuded; not even a shrub being left to weep over the mournful fall of the majestic forest; but stumps, black, naked, and deformed, like so many Stygian ghosts, by the deep shades of Erebus, and as offensive to the eye of true taste, as to every principle of feeling, alone ruling over and marking the sad scene of desolation. Just such havoc has been committed all along the beautiful banks of the Niagara, and for one I would give a handsome sum to have back a belt of a few rods wide on our front, of the magnificent decidious and evergreen trees, that originally hung in soft and graceful foliage over the land.

It is objected, that if trees are left in clearing up, that they quickly die or blow down. So they will if *single*, but not if in *masses*. They then lend shade and shelter to each other; and if one occasionally decays or is uprooted, a sufficient number is still left to supply the place of those destroyed, and these daily become stronger, spreading in roots and branches, and in a few years are proof against wind and sun, and form a magnificent mass of forest verdure, that it is rapturous to behold, and that English gentlemen would give thousands of pounds could they but shew them on their estates. Sir Walter Scott pronounced our gigantic old forests as the *true antiquities* of the land, and added that he would preserve them with the same care and veneration that he would old feudal castles.

Very sincerely, A. B. ALLEN.

Buffalo, 19th March, 1838.

REMARK.—We can assure Mr. Allen, that any attempt to cultivate a holley, or rhododendron, or indeed an evergreen *hedge* of any plant that we know of, by plants or seeds, upon the bleak bank of the Niagara river, will be but money and labor lost. The holley will hardly stand the latitude of 40°, and the rhododendron is too tender, difficult to transplant, and unfit for a fence if it would grow. We volunteer our advice to Mr. A. that he plant a thick belt, broader or narrower—as he pleases, of indigenous trees, embracing evergreens, on his Niagara exposure, to afford shelter to his buildings and his grounds; and that he add to this shelter a substantial turf fence, at least five feet broad at the base, and of corresponding height.—*Cond. Cult.*

A hint worthy of notice.

Schenectady, 2d April, 1838.

DEAR SIR,—Since I wrote you, on the subject of feeding down wheat and rye in the spring till June, to keep it back from blossoming a month later than usual, till the fly of the grain-worm had spent his allotted time for depositing his eggs in the blossoms, I have conversed with a Mr. Smith, of Schuyler, nine miles below Utica, and advised him to feed his wheat for the experiment, which he promised to do. After a little reflection, he said that he had often mowed down *oats* after they had grown six or eight inches high, on stony and rich ground, which put them back, and caused the stalks to thicken and become strong, which prevented them from falling, or lodging, which they were apt to do on rich ground. I advised him to try the experiment on strips of his wheat, through his field, and after harvest, to give you the result. He promised to do so. Most respectfully,

JESSE BUEL. D. TOMLINSON.

We think, with our correspondent, that both mowing and feeding, are worthy of an experiment, as a preservation from the worm. There is another consideration: Grain that ripens in cool weather, say late in August or September, will be heavier, ordinarily, than that which is hastened to maturity by hot weather.—*Cond. Cult.*

"To avoid the Bee-moth."

Let your bee-house and hives be kept well whitewashed, also the short boards on which each hive stands, particularly the underside; on each, place two or three quarts of fine earth, one part salt, mixed, for the hive to rest upon. Change once or twice during summer. I found good cause to abandon placing bees on the ground, as had been recommended twenty years ago. C. WHITNEY.

English Berkshire Pigs.

Mr. BUEL,—Sir,—Circumstances have transpired, rendering it incumbent on me to *caution* the public against certain impositions practised in regard to the Berkshire pigs. Persons in this vicinity, either through ignorance, or regardless of their honor, are constantly palming off, as full bred, half and three-fourths of Berkshire, crossed with the hogs common in and about Albany.

They make good individuals, and would very much improve the common hog of the country; those approximating nearest to the *pure blood*, resembling them so much in appearance and colour, that a person, not well acquainted with the true breed, would be very easily deceived. I would not wish to be understood as derogating in the least, from the good qualities of this cross, but *I do protest* against the imposition of palming them off as the genuine Berkshire breed. Let them be sold for *grade* animals—for what they really are—half, three-fourths, &c. &c. of Berkshire, crossed with the "China," "Mocho," "Grass-breed" or common hog of the country.

About two years ago, a gentleman of an adjoining county engaged of me a pair of Berkshire pigs, and before I was enabled to supply him, he chanced, in a neighboring town, to meet with a lot of, to him, very fine looking pigs, which the owner represented as *genuine Berkshire*. The sequel was, the unsuspecting gentleman purchased a pair and took them home, and never discovered the deception until he compared them with some his neighbor procured of me. All the claim they had to Berkshire blood was, their parents were obtained in the county of *Berkshire, Massachusetts*.

I have not unfrequently been invited to look at a very fine Berkshire sow or boar, which their owner would affirm to be genuine, and on making some objections to their points, colour, &c. when the white colour predominated, I would be answered "why the mother was *entirely* white," &c. &c. Now, I have the charity to believe, that in most cases, it is more through ignorance than design.

There are persons in this vicinity who possess the *pure unadulterated English Berkshire* breed, which were either procured of Mr. Hawes, my predecessor, or from myself and others, that would spurn at the idea of selling a *mongrel* for full blood.

The three imported sows and boar I now own were selected in England, from different families of the same breed—still the resemblance is so great, and they breed so near alike, that a person would be puzzled to select a pig from a particular sow, when mixed in a pen together.

Some objections have been made to this breed in regard to size; to such I would observe, that in England they have been made to attain six, seven, and even eight hundred pounds.

The demand in this country has been so great, that very few of the full bloods have been fed. I killed a barrow in November, 1836, eighteen months old, fed for a short time in the fall, (after running in a pasture three months in the summer without any feed, except grass) on raw and boiled potatoes with a small quantity of soft corn; he was not fat, and when dressed weighed 312 lbs. Some of the same litter were fed and killed when nine months old, and weighed from 175 to 185 lbs. A three year old boar was altered in the spring and fed last fall, which I have been informed, weighed, when dressed, over 500 lbs. It is said they can be fattened at any age, and to very great weights, and at little expense, in comparison with other varieties.

A gentleman in Dutchess county put in a pen one of the Berkshire and one of the common pigs—fed them alike, and the consequence was, the Berkshire grew so *fat* and lazy, they were obliged to help him up to eat—while the other grew so *poor* that he required the same assistance at his meals. I do not assert this as a fact, but so the story goes.

Another gentleman, from one of our western counties, after examining my Berkshires, said to me, "I have just as good pigs at home, as these, with one exception—and that is, they have no *kink* in their tails." I need only say, that this gentleman owns a flouring mill, and "millers never have poor hogs."

Now, I do not say or pretend, that the Berkshire hogs will live on *air*—but I do say, they will grow larger and take on fat faster, with the same quantity of food, than any other breed I am acquainted with.

The demand for this breed, last year, was so great, that Mr. Lossing, of Albany, sold a pig (which he obtained of me) when thirteen months old, for $80. Others from six to ten months, were sold at from $25 to $50. Sucking pigs, only five weeks old, brought from $15 to $25 each.

My price for pigs, from six to eight weeks old, is invariably $10 each, or $20 per pair—cage to send them in, from $1 to $1.50, according to size, delivered in Albany.

Those gentlemen who ordered pigs in 1836–7 will please signify by what conveyance and to whose care they are to be sent. Some will be ready for sending off in all this month. Letters, *post paid*, will receive due attention.

C. N. BEMENT.

Three Hills Farm, Albany, May 1, 1838.

Agriculture—Its Usefulness.

Agriculture is a branch of business of the highest importance to mankind. By far the greater part of the human race are either directly or indirectly dependent on it for subsistence. In this region of country but very little is obtained for the support of man, but what may either be justly denominated agricultural produce, or is in some way or other derived from it, as for instance, the most of our animal food.—From these considerations arises the importance of the subject, and consequently its dignity; and hence the laudable pursuit of agricultural employment. The maximum of praise, however, is not due to him who labors with the greatest assiduity or energy, nor even to him who uses his tools with the greatest dexterity or skill. For, as according to the old maxim "a spur in the head is worth two in the heel," he may be most beneficial, to the community at large, who officiates in some department of the business which requires principally the exercise of the mental faculties. And, so every one in the subordinate sense in which his labors are beneficial to mankind, has a claim on his fellow men for their respect. Y.

Experiments in producing improved varieties of Indian Corn.

Baltimore, April 6, 1838.

Judge BUEL,—In the last number of the Cultivator (page 51) I observe the following remark by the conductor:—"The idea of improving our corn by artificial crossing, is novel, yet perfectly philosophical."

Some ten or twelve years since, I instituted a series of experiments in crossing different varieties of corn, and was perfectly successful. The variety of corn named in Dr. Brown's list (page 43 of the same number) "No. 16, Pennsylvania 8 rows, called Smith's early white," was the result of one of the experiments. It was produced by what we call the *Tuscarora*, or "New-York cheat," with the *Sioux* (No. 9 of Dr. Brown's list.) From the parentage of this new variety, you would naturally expect a mulatto color; but I will explain why it is *pure white*, as I go along. I had two objects in view, the one to get the large white grains of the Tuscarora on the small cob of the Sioux; and the other to produce a variety earlier than either, if possible. To accomplish my object, I planted a piece of ground, say the eighth of an acre, with both varieties, one in each alternate hill; but as the Tuscarora was known to me to be from 15 to 20 days later than the Sioux, I planted the latter 15 days after the former was planted. Now the process of crossing is performed in the following manner. The variety that has the cob that I wish to retain, is used as the female, and as the tassels (male flowers) appear, they are carefully cut off and suppressed; the variety whose grain I wish to get, is used as the male, and its tassels are allowed to grow. It is unnecessary to interfere with the female flowers (the silk.) The ears of corn produced by the Sioux hills had the form and size of cob of the Sioux, but the grain was a beautiful sulphur color, and of the form of the Tuscarora, though smaller. This corn I planted the next year, and the result was, a beautiful variegation of the grains, of pure yellow and pure white, though all the grains were alike as to size and shape. The cream color had evidently returned to its original elements. I then carefully selected the white grains, and planted them the third year, and the result was the establishment of the variety called "Smith's early white."—(I do not understand how or whence Dr. Brown obtained the name of *Pennsylvania* 8 rows.)

My experiments established the fact, satisfactorily to my mind, that you can place the grains of any va-

riety of corn upon the cob of any other variety, by the process detailed above; and that there is no object more worthy the attention of farmers than improvements of this kind. You have only to regulate the time of planting each variety, to correspond with the time of flowering. I ought to observe, that if you do not destroy the tassels of the variety that has the objectionable *grain*, the crossing will not be so perfect, because the *impregnation* will be from two males instead of one, and consequently the grains produced will be various. The crossing is equally important in producing the large late kinds small and early. You can get the tall Virginia corn (that is the grain of it) upon the early dwarf stalks. Indeed, you may vary it almost at pleasure. As you will perceive above, it requires three years to accomplish the object perfectly. The first year effects the crossing; the second year, certain characteristics return to their original elements, such as the color, and somewhat of the flinty quality; the third year the new variety is produced perfect—and will remain so, so long as it shall be kept distinct from other varieties.

Another experiment was combined by me with the above, viz.—the first matured ears of good form and size were always selected for seed. By this process I was able in five years to make my new variety from 15 to 20 days earlier than the Sioux, or any other variety. I had green corn on my table for some years, two weeks earlier than the hotels who obtained early corn from Norfolk. I beg to observe, that the Smith's early white has but eight rows, and the Sioux (the female parent) twelve; now to account for this. After I had produced the variety, I was still desirous of putting it upon a smaller cob; hence I planted it with the sugar corn, using the latter as the female.—The result was the eight rows. I also once took a notion to give it a red cob, and had no difficulty in doing so, by using the red cob sugar corn as the female; but I recrossed and got rid of the red cob again, because it stained the lips and fingers while eating it.

Excuse this, from an old admirer,

GIDEON B. SMITH.

Judge BUEL,—Sir,—I commenced raising ruta baga turnips last season, and am much pleased with the result. In order to ascertain when was the best time to sow them, I sowed some the first day of June, some the 13th and some the 24th day of June, and found that those sowed first were much the best. I would recommend to sow as soon as the 25th of May in this latitude, 43° 30′ north. I prepare my ground by ploughing in long manure, and spread fine manure on the furrows, and only harrow it in after the ground is well harrowed. I drag it with a bush, which completely pulverizes and mixes two or three inches of the surface of the ground.

I make my bush by boring holes in a stick six inches in diameter, six feet long, with a large auger, and fasten in bushes eight feet long, and then lash on another stick of sufficient heft across the middle, to keep them in place. I would recommend to bush all land that is stocked with grass seed for mowing. Those that cannot obtain a drill-barrow, may make a thing like a rake, with a tooth in each end of the head, one inch thick, sharp at the point, and mark the ground, and sow turnip seed by hand, or any other seeds they wish to sow in rows.

My method of harvesting turnips, is to take a sharp hoe and chop off the tops first and gather them into heaps, and then dig them with hoes,* which is a more expeditious way than to pull them by hand, and then cut the tops with a knife.

My land is a light sandy loam, not naturally good wheat land. Last spring I commenced liming my wheat ground; I put six bushels of unslaked lime on half an acre after the land was ploughed. I put a peck in a place, and covered it with earth, and let it remain three days, when it was completely slaked, and then spread it evenly over the ground, and then sowed my wheat and obtained a good crop, and no smut. My wheat was sown the 27th day of May; on the same day one of my neighbors sowed one acre and a half with the red chaff beardless wheat, and obtained sixty-one bushels from it.

A. C. HOWARD.

Thetford Post Mills, March 27th, 1838.

Brussa Mulberry.

New-York, April 7th, 1838.

J. BUEL, Esq.—Dear Sir,—You will herewith receive one hundred Brussa mulberry trees, which please accept for inspection and for your own appropriation. This is an original tree, imported in the month of June, 1837, from Smyrna, and were so long detained in their passage, as to make their growth doubtful—but from a quantity, a portion vegetated and grew from the root and slip, as you have herewith. They are, undoubtedly, the real Brussa tree. As the consigners had no knowledge whether or not it would be a favorite tree with us, for this cause the best, that even at the time they arrived here, no information was communicated to the public that the Brussa tree was of a superior kind, nor not, indeed, until you brought it forward through the valuable columns of your paper. It is no doubt one of the most valuable that has ever been introduced; and to satisfy the minds of the wavering, your opinion would, if communicated through your next journal, decide the matter, and silence the doubts and impressions that are exerted to be made on those who are desirous of purchasing, by the gentlemen of Flushing, who have not the tree. I have this invoice of trees to sell, and have about ten thousand or more; and although I intend to go on propagating, still I must close the whole invoice, they belonging to the owners residing in Smyrna. Yours,

NICHOLAS HAIGHT.

* The hoe often cuts and bruises the roots. They should be pulled with the hand, and laid in rows; they may then be expeditiously topped with a large knife or spade.—*C. Cult.*

EXTRACTS.

Science of Gardening.

The extracts which we shall give under this head, are from the "*Alphabet of Scientific Gardening*, by Prof. Rennie, of King's College." They are as applicable to farming as to gardening. They elucidate the great principles which govern in vegetable economy; and although they may seem abstruse to some, they nevertheless furnish valuable data, which all may profitably recur to; and we commend them particularly to the notice of the young, who aspire to usefulness, or eminence in the arts of rural labor.—*Cond. Cult.*

ARTS AND SCIENCE.

"The arts," says Sir John Herschel, "cannot be perfected till their whole processes are laid open, and their language simplified and rendered universally intelligible. Art is the application of knowledge to a practical end. If the knowledge be merely accumulated experience, the art is *empirical;* but if it be experience reasoned upon and brought under general principles, it assumes a higher character, and becomes a *scientific art.* In the progress of mankind from barbarism to civilized life, the arts necessarily precede science. Applications come later: the arts continue slowly progressive, but their realm remains separated from that of science by a wide gulf, which can only be passed by a powerful spring. They form their own language, and their own conventions, which none but artists can understand.—The whole tendency of empirical art is to bury itself in technicalities, and to place its pride in particular short cuts and mysteries, known only to adepts; to surprise and astonish by results, but conceal processes. The character of science is the direct contrary. It delights to lay itself open to inquiry; and is not satisfied with its conclusions, till it can make the road to them broad and beaten: and in its application it preserves the same character; its whole aim being to strip away all technical mystery, to illuminate every dark recess, and to gain free access to all processes, with a view to improve them on rational principles. It would seem that a union of two qualities almost opposite to each other—a going forth of the thoughts in two directions, and a sudden transfer of ideas from a remote station in one, to an equally distant one in the other—are required to state the first idea of *applying science.*"

THE WORD GARDENING.

The chief difference between "Gardening"* and Farming appears to exist in extent. The surface tilled being more extended, and the crops produced being often more coarse and hardy in farming, the operations require less minuteness and refinement, which, indeed, would seldom yield the farmer an adequate return for the money laid out. Whereas in gardening, the most refined and minute processes are frequently indispensable, in proportion to the delicacy of the plants which are reared, more particularly with respect to artificial shelter and artificial climate. Gardening, then, is a sort of refined farming upon a limited scale.

By "Scientific" Gardening, I mean the rearing of garden plants of every kind, useful and ornamental—kitchen vegetables, roots, fruits, and flowers, according to principles capable of being demonstrated by experiment or inference. What may, on the other hand, be called *routine* gardening, is founded not upon such principles, but upon vague and uncertain experience.

Nobody, I think would be so fool-hardy as to question the high value of experience; but mere experience, without the aid of science—I mean experience without accurate investigation of causes and effects, and without sound reasoning from observed facts—is just as apt to mislead as it is to direct aright, and often, I believe, much more so. Science again without experience will equally mislead.

The value of scientific knowledge in gardening being thus indisputable, it will be important to render it easily attainable, by putting the facts upon which it rests in as plain a manner and in as short a space as I can. For this purpose, it will be most advantageous to consider, first, what it is that nourishes garden crops, that is, the food which garden plants require; and then, upon what scientific principles this food can be best supplied by the gardener in his daily operations. He might, indeed, as well think of rearing rabbits or canary birds as of raising garden crops without food. My subject accordingly has two grand divisions—the Food of Plants, and the Philosophical Principles of Garden Operations for the management of this food.

* Technically, *Horticulture*, from the Latin *Hortus*, a garden, and *Cultura*, tillage; a pedantic term, of no use whatever in the English language.

FOOD OF GARDEN PLANTS.

It is obvious that a cabbage, a pine apple, or a primrose, can no more live without a due supply of food, than a rabbit or a canary bird; but animals must moreover have a peculiar kind of food; the rabbit, greens and oats; and the canary, rape, millet, or other small seeds; while in the case of plants, which are fixed to a spot, and cannot travel about to select their food, such differences, when they do exist, are not often of practical importance, the food of all plants being nearly, so far as it is known, very similar in kind.

The principal difference in most garden plants compared with others, is their greater delicacy; and hence so far as practice is concerned, their food must require, if I may use the term, more delicate and refined *cooking* and management. This will appear as we proceed, in the several branches into which it will be advantageous to divide our subject, beginning with what may be termed Garden Chemistry, meaning thereby a detail of the chemical elements which enter into the food of garden plants.

GARDEN CHEMISTRY.

Passing over, for the present, the food on which young plants are nourished at their first germinating from seed, which is as different, as we shall afterwards see, as the milk diet of our own infancy is from beef and bread, let us consider the food requisite for plants after they have exhausted the milky pulp contained in the seed lobes and seed leaves.

After young animals are weaned, they are nourished upon either vegetable or animal substances, or a mixture of both, together with water for drink, that is, a solvent to dissolve the more solid matters. These have to undergo the process of digestion in the stomach, where the heat is uniformly ninety-eight degrees, and the mixture of the various substances effected by the motion of the stomach, which is similar to that of an earth-worm.* On the pulpy mass† thus produced in the stomach passing onwards towards the chyle-gut,‡ it is mixed with a portion of bile which separates it into two portions, one useless,§ that passes off through the bowels, and another useful,‖ which is taken up by the mouths of innumerable small tubes¶ that open on the inner surface of the intestines, and after all these small tubes unite into a single large one,** they discharge this useful portion into the blood. Such, in brief, are the first processes by which animals are nourished with food.

Plants, on the other hand, having no stomach, like animals, for the digestion of food, and not being capable of travelling from the spot where they are planted, (except very partially by extending their roots) must depend altogether on what they can meet with there.

We find, accordingly, in the surface earth, or soil where the roots of plants are, that processes are always going on very similar to digestion in the animal stomach; I mean that portions of animal and vegetable substances in the soil are dissolved (I might in one sense say digested) and mixed with the water and air diffused through the soil.

In this point of view, the whole of the soil where a plant is rooted, may be considered as similar to the mass produced in the animal stomach by the first process of digestion, and consisting of two portions, one useful and the other useless. The soil would thence appear to perform an office similar to that of the animal stomach, in preparing the food of plants—the process, independent of other circumstances, going on more slowly from deficiency of heat in the soil, which, in this climate at least, is, on an average, far below ninety-eight degrees, which is the heat of the animal stomach.

The only thing in the soil that appears similar to the motions of the bowels of animals, by which the digested food is brought to the mouths of the little tubes, to be forwarded to the blood, is the motion†† of the water, or moisture in which the useful portion of the vegetable and animal substances are dissolved, a motion quite indispensable, as we shall afterwards see. The water being then diffused through the soil, a portion of it must offer itself to the tips of the root fibres, or rootlets, where are suckers‡‡ somewhat similar to those on the inner surface of the animal intestines.

It being of the first importance to ascertain of what materials the useful portion of the substances thus dissolved in water consist, many experiments have been made for that purpose; but the great difficulty of the subject has caused much diversity of opinion among those who have engaged in the inquiry. As it would, I think, be unprofitable, if not injurious, to distract the beginner with conflicting views here, which he can examine at leisure in larger works, I shall confine myself to what is least disputed and most generally adopted.

* Technically, *Peristaltic*, or *Vermicular* motion.
† Technically, *Chyme.*
‡ In Latin, *Duodenum.*
§ In Latin, *Feces*, or *Excrementa.*
‖ Technically, *Chyle.*
¶ Technically, *Lacteals.*
** Technically, the *Thoracic Duct.*
†† Technically, *Percolation.*
‡‡ Technically, *Spongelets*, in Latin, *Spongiola.*

Upon trying, by means of chemical tests, the materials taken up by plants from the soil, they are found to consist of water, with which are mixed carbonic acid gas, and nitrogen or azote, along with a few other principles, usually in small proportions, which it may be well to examine separately.

WATER.

From experiments made by Van Helmont and Boyle, who reared plants in earth previously dried in an oven, and by Du Hamel and Bonnet, who reared others upon sponges and moss supplied only with water, it was concluded that water alone is the food of plants; though the inference is faulty, in consequence of overlooking what might be contained in the water before it was used, and also what it might afterwards derive from the atmosphere, as well as from the earth or the sponge. That water, indeed, was not all the food necessary, was proved by the plants so treated not remaining healthy; and it is well known, that though hyacinths and other bulbs will flower in glasses containing nothing but water, yet they never in such cases form seed; and if thus kept for a few months, they will infallibly die, as other plants do when placed in calcined or roasted sand, and watered with distilled water. The hyacinths in glasses, moreover, are not found to thrive unless the water is frequently changed, indicating that it is not the water alone, but something in the water which has become exhausted, or at least deteriorated, by the slimy matter thrown out by the roots.

The materials, which water holds or may hold dissolved, are therefore important to be ascertained, and this may be partially known by color, taste or smell, but more correctly by chemical tests. It is only, however, requisite for gardening purposes, to discover the materials which may prove useful or hurtful, and these, for the most part, are but few in number.

Among the substances useful to vegetation, dissolved in the water of soils, may be reckoned atmospheric air, carbonic acid gas, hydrogen gas, humic acid, and a small portion of the salts of lime and potass.

Among the things hurtful, are most of the acids, the salts of magnesia, and iron, metallic substances in general, and stagnant water.

It is also important to bear in mind, that the purest water is not a simple substance, but composed, as discovered by Cavendish, of eight parts oxygen gas, and one part hydrogen gas, or two volumes of hydrogen and one of oxygen, the correctness of which composition is proved by exploding, or burning these proportions of the two gases together, when the result is pure water. Plants seem to have the power of decomposing the water which enters into their system from the earth or the air; that is, of separating it into its component parts, oxygen and hydrogen.

Socrates in Praise of Husbandry.

It was the noble aim of Socrates, the Grecian sage, according to Cicero, to bring down philosophy to the level of common capacities, to render it more useful in common life, and to apply it solely to what might make men more rational, just and virtuous. In the extracts from Socrates, below, which have been handed down by Xenophon, we find Cicero's words verified: philosophy is happily applied to agriculture, and to the common business of life.—*Cond. Cult.*

"There is no condition of life," says Socrates, "however exalted, that should exempt a man from the practice of agriculture. By exciting in the soul an arduous activity for labor, it diffuses the most pure and delightful satisfaction. In augmenting our riches, it exercises the body, and gratifies every rational wish of a free agent. The earth not only rewards the toil of cultivation with those blessings essential to the support of life, but also indulges us with whatever can contribute to the embellishment of our persons, our houses, our temples! Our senses are regaled with the most agreeable and exquisite perfumes, and enraptured with varied prospects of hanging woods and enamelled meads.—The increase of flocks and herds, necessarily arising from agriculture, is productive of a variety of aliments for the sustenance of man. But in this liberal dispensation of her choicest gifts, the earth denies their enjoyment to sloth and inactivity; requiring rather that the body, habituated to the inclemency of winter, and the fervid heat of summer, should become almost invulnerable, and capable of enduring every kind of fatigue. The task of manual labor, in obliging us to be thinly clad, considerably augments the strength and vigor of the constitution; and the necessity of rising early, incumbent on all good husbandmen, by a uniform course of exercise, renders them robust, diligent and courageous." * * "What other art so bountifully distributes to its votaries the necessary wants of existence? Or what other art so amply recompenses their care and assiduity? A cheerful fire-side in the country, and a warm bath, resists the roughest blasts of winter; and a free circulation of air, the coolness of winding rivulets, and lofty groves, abate the intolerable ardor of summer. A man of independent fortune will find agriculture the most agreeable and satisfactory of all employments, and what will find him with maxims for the strictest propriety of conduct in any station of life. In the cottage, justice is never perverted, since the best laborer is always the best paid. Humanity, and reciprocal assistance to the wants of their fellow creatures, are daily practised by those employed in cultivating the same field with the sweat of their brow. Here the general may learn to instil obedience into his troops, by following the example of the farmer, who invites his laborers cheerfully to fulfil the task assigned them; rewarding the diligent and punishing the idle. A good farmer sees the indispensable necessity of animating his laborers, in the same degree a general does his soldiers; and the hired peasant, who works for bread, has even more occasion for encouragement to perform his task with alacrity, than the voluntary companion of honor. Reverence to the Superior Being is always inculcated in the most forcible manner, from a constant series of observations, that all things are dependent on the will of Providence; that snow and hail, frost, drought and storms, blights, and a thousand epidemical maladies, destroy the fruits of the earth, and defeat the best efforts of assiduous industry, directed by consummate prudence.

"Agriculture seems to possess an incontestible right to the title of parent and nurse of all other professions. Observe a country where agriculture flourishes, and you will behold arts and sciences flourish in equal perfection. But where devastation lays waste the soil, or slothful neglect induces men to leave the earth uncultivated, a general stagnation in maritime, as well as in commercial affairs, immediately succeeds.

"I have studied, with uncommon assiduity, the characters of men of every profession, who have been distinguished for prudence and understanding. I observed with astonishment, that among those engaged in the same occupations, some were rivited in penury and want, whilst others enjoyed affluence and ease. The cause of this inequality seemed worthy of the exactest and most accurate examination; and the pains I took to investigate it at length succeeded; I perceived that those persons who formed no regular plan of life, strangers to reflection and foresight, thoughtless of to-morrow, were, by the negligence of their conduct, the sole authors of their own distresses and disappointments. Those, on the contrary, whose steady and enlarged principles govern and guide their sagacious and determined views; who unite, in their several professions, diligence and attention, order and punctuality, qualities which smooth the rugged paths of life, will find the journey more easy, more speedy, and infinitely more lucrative.—These are maxims which, whoever attends to, must gain his point, in defiance of opposition, and amass wealth, should the malignity of men, or demons, endeavor to wrest it from him.

Capital.

[*From the New-England Farmer.*]

Ah! but he has no capital to begin with! Very often, very often we hear this said; and uttered in such piteous tones, that we are in such cases almost tempted to ask, what extraordinary and melancholy destitution does this young man, who is thus compassionated, labor under; or what singular calamity has befallen him, that he is thus held up as the victim of misfortune!

He has ordinary talents and capacity for labor; he has health and strength; he has enjoyed and improved the advantages of a useful education; he has acquired, or is in the way of acquiring, a respectable and good trade; he is not the slave of any bad habits; and above all things his character is good, and he has lived without reproach. Because he has no *moneyed* capital, you choose to pity him: now I entreat you, reserve your compassion for some more worthy object. He does not demand your pity half so much as your congratulation. He is much more an object of envy than of pity. "But he has no capital." Now what is capital? In respect to trade, or the business of acquiring wealth, capital is the means or instrument of acquisition and accumulation, and is generally applied to the money or property on hand not required to be consumed for immediate subsistence, but which we can use or apply for the purposes of begetting more. In an agricultural view, land which we may render productive by cultivation, or the seed which we cast into the ground, and which, under favorable circumstances of situation, season, and culture, will multiply and return to us very often a hundred or a thousand fold, is capital. In a commercial view, capital is property beyond the wants of immediate subsistence, which you can invest in goods or articles of trade, and hold them in your possession, until under favorable circumstances you can sell, or exchange, and realize the profits of such adventure. Capital, in short, is money on hand, or the reserved profits of former labor, and speculation, or trade, which you can use for other and further purposes of trade and accumulation, and be able to wait its returns. But there is much other capital besides land or money. Every means of accumulation should be considered as so much capital. There is another agent in trade of equal power, as a means of accumulation, as money, and that is credit. This is often even far better than a moneyed capital. This will enable you, as far as you ought to desire it, to command the moneyed capital of other men, as if it were your own, and to use it for your benefit and theirs; and where it is based upon those substantial qualities of character, which form the only just and sure foundation of credit,—namely, truth, honor, industry, frugality, exactness, or punctuality,—it may be used with equal success and propriety as the instrument of accumulation, as the heaped up thousands which lay in the coffers of the most affluent.

Every thing in relation to matters of trade, and the pursuits of wealth, which is a means of accumulation, is capital. Now let us see, then, with what propriety it can be said of this young man of whom we have spoken, though he has no money at his entrance into life, that he has no capital; or rather, let us see what renders him an object of compassion.

He has youth, health, and ability. These all enable him to labor, and labor will command its reward. He has habits of frugality, which will lead to expend carefully, and lay up the surplus wages of labor,—that is, the surplus beyond his immediate necessities. He has the elements of a good education; this furnishes him the means of acquiring more knowledge, and knowledge is always power. He has an art or trade; and this gives him an immense advantage, and puts it in his power to apply his labor and faculties with far more advantage and profit than he could without. He is not the slave of any bad habits; his gains therefore are not insensibly creeping away from him. Above all, he has good character, this will give him credit. Habits of industry, frugality, and exactness, will secure, establish, and increase his credit to all the extent he should desire; and give him the command of the property of others. All this, then, is capital—capital of the best kind. A purely moneyed capital may pass away from him by a thousand contingencies; but this other capital, which I choose to call a moral capital, is under his own control, secure from all the fluctuations and vicissitudes of trade and business, and never can be taken from him without his own consent.

For a young man to be placed at once in the possession of a large moneyed capital at his setting out in business, though it may be highly gratifying to his vanity, is extremely hazardous to his virtue. I have known in such cases innumerable instances of deplorable failure and bankruptcy. The passion for speculation, over-trading, and extraordinary gains, to which they are excited by the possession of a large moneyed capital at setting out, leads men into a thousand risks, which they cannot encounter without extreme peril. On the other hand, those habits of care and caution, which small means, and gradual and moderate earnings beget, are a sure foundation of increase and security.

Large means and extensive speculations, where the possessor has had no lessons in a humbler sphere, nor been compelled by an early and stern necessity to proceed with the greatest caution, almost inevitably lead to habits of wasteful expenditure. "Many estates are spent in the getting." Wealth and accumulation depend as much upon saving as upon gaining.

To say of a young man, therefore, coming into life with health, strength, capacity for labor, a good education, a useful and respectable trade, habits of sobriety and frugality, and above all a good and unsullied character, that he has no capital, is a gross absurdity and error. He has the best of all capital—a moral capital; the noblest of all power—moral power; he has the most certain means of honest and honorable accumulation and fortune, and may be sure, under circumstances ordinarily propitious, to rise to that competency of influence, respect and general confidence, and that honorable measure of wealth and independence, which should fully satisfy a reasonable and virtuous ambition. H. C.

Cheering Prospect.

[*From the Franklin (Ky.) Farmer.*]

Our information from all quarters indicates that the coming agricultural year will be one of unprecedented activity and spirit in Kentucky. Improvement in the breeds of horses, cattle, mules, sheep and hogs; in all descriptions of seeds; in modes of culture; in feeding; and in agricultural implements, is now "all the rage." In the present year, our farmers will sow more and better seed and reap larger and richer harvests. There will be an improvement in the number and quality of all kinds of domestic animals. Why, some of our breeders are incurring considerable expense to improve the breeds of poultry, though Kentucky boasts the possession of the "game cocks" of creation. Our farmers will have better fences than formerly; and many well painted gates will be substituted for those annoying *inconveniencies*, "draw bars" and "slip gaps." The fence corners will be freed from weeds, and corn or grass will take the place of briars in the old fields. The logs, brush and undergrowth in the woodland pastures will be cleared out; and blue grass will be set in their place. Many of our Green river friends will abandon tobacco planting and adopt the grazing business instead. The root culture will be more generally and more energetically tried, and its adaptation to our soil and to the purpose of feeding stock, will be verified or disproven. The silk culture will receive wider attention, and many

new mulberry orchards will be planted. The breeders will provide more house-room to protect their horses, cattle, and sheep from the inclemency of winter. There will probably be about twenty new agricultural societies organized, and a greater spirit of emulation manifested between the various societies, and the farmers themselves; and their sons will catch the same spirit, and lay the foundation for their future prosperity, in the enlightenment and information they will derive from the action of these societies. The house-wives too, will improve their domestic economy; the dairies will groan beneath the increased weight of butter and cheese; and the flocks of fowls in the barn-yard, will be doubled. The manure of the farms will be more carefully husbanded, and spread over the fields, instead of being wasted. We shall import no breadstuffs; but send abroad larger droves of live stock, and export greater quantities of corn, wheat, flour, tobacco, pickled pork, and beef, and bagging, and rope. And this acceleration of the agricultural pursuits, brought about by the joint influence of an increased spirit of improvement, with the belief that it is this interest which will disembarrass the country of its present pecuniary troubles, will also stimulate all the other branches of state industry. A higher moral influence will be attached to the labors of agriculture, and its salutary blessings will reach the whole community. The farmer will seek for more scientific knowledge; the standard of agricultural improvement will be elevated; practical truths, the ascertained results of well conducted experiments, will be applied in aid of their operations; they will read more, think more, write more, and in short, several thousand more of their names will be added to the subscription list of the Franklin Farmer.

Young Men's Department.

Hints to Young Farmers—No. VII.

INDOLENCE.

Beware of habits of indolence. They are the bane of happiness. Action is the first law of nature to animal creation, and even to some of the primary elements. Water, when long at rest, becomes putrid, and deleterious to animals and vegetables. Air is only fit for respiration while it is kept in motion. Most of the metals lose their lustre, and become corroded with rust, if not kept in constant use. So the human body, and noble mind, by inaction, become stagnant and corroded, and too often taint the moral atmosphere. Action—constant useful action, is the first requisite to health and usefulness. What matter of surprise should it be, then, to hear men—young men—whom fortune, honor, and happiness invite to action—to hear them complain that they *have nothing to do!*—and to see them dragging out lives of sloth and indolence, or hastening their termination, by intemperate indulgencies.

There is a strong propensity in young men to indulge in indolence, as soon as they feel confident they can live without labor, which should be met and conquered at the threshhold of manhood; for if then left unsubdued, it will take root, and, like the young oak, grow in strength with increase of years. The acorn is easily destroyed; but when the acorn has become a tree, it is difficult to uproot it. The propensity to indolence once mastered, and habits of industry well established, be they manual or mental—both are best conjoined—the current course of life is comparatively serene and prosperous. Systematic habits of industry and moral rectitude, are a far better portion to a young man, in the outfit of life, than a large fortune without these habits. The first seldom fail to elevate the possessor to wealth and respectability; the latter to sink him in both. There are more men of wealth and standing in society, who have become wholly so by their personal exertions, than there are that enjoy these distinctions by hereditary descent. There is perhaps no circumstance so propitious to success in life, as a resolute determination in the outset, to rely solely, under Providence, upon one's personal exertions—upon his industry and integirty—for fortune, fame and happiness. Such a resolution is oftener the result of necessity than of choice; but where, from either cause, it becomes the governing principle, it imparts a dignity and an independent bearing worthy of all praise, and impels to the most worthy actions. Who that has resolved, that he can and will provide for himself, would become the sycophant of power, the pander of vice, or the dependant upon the liberality or charity of others? The scramble for office, which annually distracts and demoralizes our country, owes more of its violence to the desire of men to live at the public expense, than from any cardinal difference in principle in the great body of the American people.

We will close this article with the following extract from Addison's Spectator, upon the subject which we have been discussing:—

"Indolence is a stream which flows slowly on, but yet undermines the foundation of every virtue. A vice of a more lively nature were a more desirable tyrant than this rust of the mind, which gives a tincture of its nature to every action of one's life. It were as little hazard to be lost in a storm, as to lie thus perpetually becalmed; and it is to no purpose to have within one the seeds of a thousand good qualities, if we want the vigor and resolution necessary for the exerting them. Death brings all persons back to an equality; and this image of it, this slumber of the mind, leaves no difference between the greatest genius and the meanest understanding. A faculty of doing things remarkably praise-worthy, thus concealed, is of no more use to the owner, than a heap of gold to the man who dares not use it.

"The time we live ought not to be computed by the number of years, but by the use that has been made of it; thus, it is not the extent of ground, but the yearly rent, which gives the value to the estate. Wretched and thoughtless creatures, in the only place where covetousness were a virtue, we turn prodigals! Nothing lies upon our hands with such uneasiness, nor have there been so may devices for any one thing, as to make it slide away imperceptibly and to no purpose. A shilling shall be hoarded up with care, whilst that which is above the price of an estate, is flung away with disregard and contempt."

Chemical Catechism.

We wish to infuse into the minds of our *young* readers, and we would hope to infuse into the minds, too, of those who do not claim to be young, so much taste for chemical knowledge, as shall induce them to study it, in hours of leisure, as a means of affording them a high intellectual gratification, and of contributing largely to their prosperity and usefulness in life.

Chemistry has become so essential in the successful management of all the arts of productive labor, embracing even the household arts, that its study is now made a branch of education in the common schools of France and of many of the German states. Judging from our own experience, a knowledge of many of its leading and more important principles, may be readily acquired by persons of common capacity; and the further one progresses in his knowledge of this science, the more it delights the mind, and the more it becomes subservient to the useful purposes of life. In the view of its great importance to society at large, we propose to publish in the Cultivator such parts of Parkes' Catechism of Chemistry, as we shall consider particularly beneficial to the generality of our readers. We extract the following from the author's essay on the utility of the study of chemistry, particularly to illustrate the advantages of this science in the business of agriculture.

"From the present state of chemical knowledge," says Parkes, "and the rapid improvements which have been made in our arts and manufactures, by the judicious application of its principles, it is become very desirable that every youth should be acquainted with its rudiments, and that chemistry should be made a regular branch of education in every seminary where the sciences are professedly taught and explained.

I have, therefore, imagined that I should render an acceptable service to society by showing the advantages which would arise from the acquisition of this kind of knowledge; especially as a large proportion of the community is not apprised of its real value.

The well informed people of France are so fully convinced of the importance of chemical knowledge, that chemistry has already become an essential part of education in their public schools. It shall be my business in this place to endeavor to demonstrate it to be of *equal* importance to the various classes of our countrymen, that the science should be cultivated with the same ardour in these kingdoms. The branch of education we recommend to your regard, has for its object every substance of the material world, and, therefore, is equally interesting to every civilized nation upon the earth.

Is your son born to opulence,—is he the heir to an extensive domain? make him an analytical chemist, and you enable him to appreciate the real value of his estate, and to turn every acre of it to the best account.

Chemistry will teach him also how to improve the *cultivated* parts of his estate; and by transporting and transposing the different soils, how each may be rendered more productive. The analysis of the soils will be followed by that of the waters which rise upon, or flow through, them; by which means he will discover those proper for irrigation; a practice, the value of which is sufficiently known to every good agriculturist.

Should he *occupy* his own estate, and become the cultivator of his own land, he must of necessity be a chemist, before he can be an economical farmer. It will be his concern not only to analyse the soils on the different parts of his farm, but the peat, the marl, the lime, and the other manures must be subjected to experiment, before he can avail himself of the advantages which might be derived from them, or before he can be certain of producing any particular effect. Besides, a knowledge of the first principles of chemistry will teach him when to use lime *hot* from the kiln, and when *slaked;* how to promote the putrefactive process in his composts, and at what period to check it, so as to prevent the fertilizing particles becoming effete, and of little value. A knowledge of the chemical properties of bodies will thus give a new character to the agriculturist, and render his employment rational and respectable.*

The various operations of nature, and the changes which take place in the several substances around us, are so much better understood by an attention to the laws of chemistry, that in every walk in life the chemist has a manifest advantage over his illiterate neighbor. And it may be remarked, that in case of failure or disappointment in any particular line of commercial manufacture, the scientific chemist has resources as various, as the productions of the country in which he lives, to which the uneducated man has no access.

Were parents aware of this truth, that sordid maxim, *primo vivere, deinde philosophari*, would not be heard: but every youth would be instructed in the first principles of natural philosophy and chemistry, and as the *means* for qualifying him for managing with advantage the concerns with which he might be entrusted. If "knowledge is power," surely the *love* of knowledge, and a taste for accurate investigation, are the most likely means of conducing him into that path which leads to opulence, respectability and rational enjoyment.

Moreover, it is the necessary consequence of an attention to this science, that it gives the habit of *investigation*, and lays the foundation of an ardent and inquiring mind. If a youth has been taught to receive nothing as true, but what is the result of *experiment*, he will be in little danger of ever being led away by the insidious arts of sophistry, or of having his mind bewildered by fanaticism or superstition. The knowledge of *facts* is what he has been taught to esteem; and no reasoning, however specious, will ever induce him to receive as true what appears incongruous, or cannot be recommended by demonstration or anology.

CHAPTER I.

INTRODUCTORY AND MISCELLANEOUS.

What *is chemistry?*

Chemistry is the science which enables us to discover the peculiar properties of all natural bodies, either in their simple or compound state.†

How do chemists examine the properties of bodies?

The chemical examination of bodies is in general effected by producing a change in the *nature* or *state* of the body under examination.†

By what means do chemists affect a change in the qualities or states of natural bodies?

This is generally effected by means of *heat*,§ or by the *mixture* of some other matter with the matter intended to be examined.

How does the application of heat and mixture enable chemists to examine the properties of bodies?

By these means we effect the *decomposition* of a compound body, and thus acquire a knowledge of the nature of its ingredients.

What is meant by decomposition?

In chemical language, decomposition means the art of dividing a body into its simple elements. Thus water may become decomposed, and reduced into

* Lavoisier cultivated 240 acres of land in La Vendée, on chemical principles, in order to set a good example to the farmers; and his mode of culture was attended with so much success, that he obtained a third more of crop than was procured by the usual method, and in nine years his annual produce was doubled.—*Lalande's Life of Lavoisier.*

† "Chemistry is that science which examines the constituent parts of bodies, with reference to their nature, proportions, and method of combination."—*Bergman's Essay on the usefulness of Chemistry, &c.* p. 4.

‡ To the eye many substances appear similar to other substances, though they possess different, and perhaps opposite, qualities; it therefore became necessary to discover the means of analysing these substances, and of ascertaining wherein their difference consists. These we find in chemical reagents.

It may, with few exceptions, be considered as an axiom in the science of which we are treating, that, *whenever chemical action takes place, a real change is produced in the substance operated upon, and that its identity is destroyed.* An example will place this in a clear point of view. If a little carbonate of lime (powdered chalk) be put into a glass of water, the chalk will sink to the bottom of the vessel. Though it should be mixed with the water, if left at rest it will soon subside. No chemical action has taken place, therefore the water and the carbonate of lime both remain unaltered. But if a small quantity of diluted sulphuric acid be added to a glass of chalk and water, a violent effervescence will take place the moment they come in contact with each other; a chemical union of the two substances will be the consequence of this chemical action; the identity of each substance will be destroyed; and sulphate of lime (a body entirely different from either of the substances employed) will be produced.

§ Heat has a tendency to separate the particles of all bodies from each other. Hence nothing is more necessary to effect the decomposition of many bodies than to apply heat, and collect the substances which are separated by that means. The mixture of two or more compounds, often produces a decomposition in each by means of chemical *affinity*, a property of bodies which will be more fully explained here after.

oxygen and hydrogen, which are simple substances, incapable of further decomposition.

What are the different states of natural bodies?

The matter which constitutes this lower world is usually divided by philosophical writers, into four classes, viz: solid, liquid, aeriform, and imponderable.

What do you mean by a solid body?

Solidity is that quality of bodies whereby their parts cohere firmly, so as to receive impression.*

What are liquid substances?

Liquid substances are those whose parts do not firmly cohere, but readily yield to any impression, and have free motion amongst themselves.† They also assume, when in small masses, the spherical form, as may be observed in detached portions of mercury, and are incapable of being compressed into a smaller compass by mechanical force.

What are aeriform substances?

All elastic fluids, usually called vapors and gases, belong to this class of matter.

What substances are they which constitute the fourth class, or the imponderable bodies?

These are four only, viz: light, caloric, electricity, and magnetism. They are also sometimes denominated unconfinable, or etherial substances.

What occasions the difference which is observable in solid and liquid substances?

Liquid substances are merely solids converted into liquids by heat, a certain increase of which would convert any liquid into an elastic vapor, similar to that fluid body which surrounds the globe, and is described under the name of atmospheric air.

Why is the air called a fluid?

Because it flows like a fluid; because like a fluid it presses in every direction, and because light substances will swim in it.

What explanation do you give of bodies swimming in fluids?

All fluids upon which solids float are specifically heavier than those solids. This is an established law of nature. Thus a cork swims upon water, while a stone sinks in it.

Have you a clear idea of the cause which makes some substances sink, and others swim in the same fluid?

Those which swim are lighter, and those which sink are heavier, than that fluid:—thus in water, if a substance be heavier than a portion of water of *its own bulk*, it must sink.

What term is made use of to express the relative weight of bodies?

Specific gravity. Thus the specific gravity of one body may be much greater than that of another, though their absolute weights be the same.

How do you explain the difference in the specific gravity of different bodies?

When one body is larger, or takes up more room, than another of the same weight, the first is said to be *specifically* lighter than the other, and vice versa.

What definition do you give of the atmosphere which you speak of in connexion with this subject?

The atmosphere is that very light fluid‡ which surrounds us every where: it is the medium in which we live, and without which we could not exist.

What is the specific gravity of atmospheric air?

A pint measure of atmospheric air weighs nearly nine grains, whereas a pint measure of hydrogen gas weighs little more than half a grain. The same measure of pure water weighs upwards of one pound avoirdupois.

If the specific gravity of water be so much greater than that of atmospheric air, how is water retained in the atmosphere?

The water which is taken up by the atmosphere, is not in an aqueous state, but is converted into vapor by the matter of heat.

What is the immediate cause of the waters of the earth being thus evaporated?

As the rays of the sun warm the ground, a portion of caloric, or the matter of heat, combines with a portion of the water which has fallen upon the earth, and converts it into vapour.

But what causes the vapor to rise in the air?

If a cork be placed at the bottom of a basin of water, it rises immediately to the top, because it is specifically lighter than the water; so vapor rises in the air, because it is specifically lighter than the air.

What becomes of the water which thus evaporates from the earth?

It occupies the lower regions of the atmosphere, and is preserved there partly dissolved in air, and partly in the state of elastic vapor.

How is this vapor formed into clouds?

After it has remained some time in the atmosphere, it becomes in a measure condensed by causes unknown to us; and the particles of water of which it is composed unite, and form small hollow vesicles, which accumulate together and produce clouds.

What further changes take place in this aqueous vapor?

By the operation of causes which are also in a great measure unknown, the clouds after a time become further condensed, and are converted into water, which falls again upon the earth in the form of rain, hail, or snow.

What is the use of this constitution of nature?

This principle of evaporation is of great utility; it is subservient to many natural and artificial processes; and is of perpetual use to man in every occupation of life.

Nothing so much aids us in learning, as writing down the things we wish to remember.—*Lat.*

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*Charlotte C. H. "	10	*Huntington, Suff.,	26
Connellsville, Pa	0	Hopewell, Ont.	6
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Lancaster, "	7	*Richmond, Va.	46
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Norwich, Chen.	12	Tomhannock, Rens.	7
Nineveh, Broome,	6	Tyre, Seneca,	6
*New-York city,	106	Trowman's Store, Va.	6
New Hartford, Oneida,	10	Terra Haute, Ind.	11
Newby's Bridge, U. C.	11	Thibodouxville, Lou.	6
New Vernon, N. J.	5	*Utica, Oneida,	28
*New Brunswick, "	29	Unionville, U. C.	17
Newbury, Vt.	8	Vernon, Oneida,	11
Nuttsville, Va.	11	Vincennes, Ind.	6
Newark, O.	16	*Vienna, Md.	16
*New Bedford, Mass.	43	Vernon, Ct.	11
Newington, Ct.	7	West Farms, West.	6
Norwich Town, "	22	Whitehall, Wash.	10
*Norwalk, "	22	Wheatland, Monroe,	19
*New Canaan, "	16	Westchester, West.	6
Nashua, N. H.	11	*Westmoreland, Oneida,	12
*Nashville, Tenn.	44	Warsaw, Va.	5
Newcastle, "	6	*Wilmington, "	39
Oak Hill, Greene,	6	Waterville, O.	11
*Oswego, Oswego,	29	*Washington, D.C.	23
*Oxford, Chen.,	30	Westfield, Mass.	11
*Owego, Tioga.	25	Williamsett, "	13
Oxford, Ct.	5	*Warwick, "	11
*Orange C. H., Va.	22	Wellington, Ct.	5
Plattekill, Ulster,	11	Windham, "	12
Peckskill, West.	11	Weathersfield, "	11
Putnam, Wash.	7	*Wilton, "	13
*Plattsburgh, Clin.,	15	*West Hartford, "	21
Pittsford, Monroe,	8	Williamsport, Md.	5
Peru, Clinton,	17	Williamsburgh, Pa.	5
Payson, Ill.	6	Whitesville, Alleg.	6
Poughkeepsie, Dutch.	37	Yelvington, Ky.	6

PRICE CURRENT.

ARTICLES.		New-York. April 16.	Boston. April 18.	Philadelphia April 18.	Baltimore. April 17.
Beans, white,	per bush.	.....	1 12 .. 1 50	1 00 .. 1 12½	1 25 .. 8 50
Beef,	cwt.	7 00 .. 10 00	6 50 .. 7 25	7 00 .. 9 00	7 00 .. 8 00
Bacon, western,	lb.	10 .. 10½	12 .. 13	8 00 .. 10	11 .. 12
Butter, fresh,	lb.	18 .. 25	18 .. 25	14 .. 18	20 .. 25
Cheese,	lb.	7½ .. 9	8 .. 9	9 .. 10	.....
Cotton, best,	lb.	7½ .. 11	.....	.....	10 .. 12
Flour, best,	bbl.	7 87 .. 8 00	7 87 .. 8 00	7 87 .. 8 00	9 50 .. 10 50
GRAIN—Wheat,	bush.	1 37 .. 1 40	.....	1 37 .. 1 40	1 65 .. 1 70
Rye,	bush	.....	1 10 .. 1 12	95 .. 97	85 .. 90
Oats,	bush.	40 .. 42	40 .. 42	35 .. 40	34 .. 35
Corn,	bush.	82 .. 84	80 .. 90	65 .. 70	75 .. 76
Hams, pork,	lb.	8 .. 9	12 .. 13	10 .. 12	13 .. 13½
Pork, in lag,	cwt.	.....	9 .. 10	10 .. 11	7 .. 7 50
SEED—Red clover,	bush.	12 00 .. 13 00	8 50 .. 9 00	8 .. 8 25	7 .. 8 00
Timothy,	bush.	2 75 .. 3 00	2 .. 2 50	2 .. 2 25	3 .. 3 50
Wool—Saxony, fleece,	lb.	50 .. 55	46 .. 50	46 .. 50	40 .. 45
Merino,	lb.	45 .. 47	45 .. 47	45 .. 50	39 .. 40
1-4 and com.	lb.	37 .. 38	33 .. 36	33 .. 38	25 .. 30
Sheep,	head	.....	.....	.....	.....
Cows and Calves,		39 .. 45	37 .. 35	30 .. 38	33 .. 46 60

FROM THE STEAM PRESS OF

PACKARD & VAN BENTHUYSEN.

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* Lavoisier has explained solidity thus: "The particles of all bodies," says he, "may be considered as subject to the action of two opposite powers, repulsion and attraction, between which they remain in equilibrio. So long as the attractive force remains stronger, the body must continue in a state of *solidity*; but if, on the contrary, heat has so far removed these particles from each other as to place them beyond the sphere of attraction, they lose the cohesion they before had for each other, and the body ceases to be solid."

† We have no reason to suppose that fluidity is an essential property of any liquid substance whatever; but rather that solidity is the natural state of all bodies; for we are able to reduce most substances to a state of fluidity by the combination of caloric. In general, bodies treated in this way, expand in all their dimensions, and the attraction of aggregation is so much weakened thereby, that the particles of the body slide over each other, and are put in motion by the slightest impulse. This is the only distinguishing character of fluidity that we are acquainted with. On the contrary, the greatest number of liquid substances take a *solid* form by reduction of temperature. Thus water congeals and forms ice. Even the gases show this disposition. Chlorine, or oxymuriatic acid gas, becomes concrete, and crystallises at a temperature near to that at which water congeals. All the gaseous substances, when they have lost their elasticity, by forming certain combinations, are disposed to assume the solid state, if the temperature allows it. Ammoniacal gas and carbonic acid gas, become solid as soon as they enter into combination; and hydrogen gas, the most subtle of the permanently elastic fluids, and fourteen times lighter than the air we breathe, forms, with oxygen gas, the water which becomes ice.

‡ Atmospheric air, like all other elastic fluids, yields to the slightest impulse, and is put in motion with the greatest ease; but it has not the power of penetrating many substances, like oils and some other fluids.

The facility and rapidity of the motion of atmospheric air, cannot be explained on any principle but its fluidity. Some of the winds move nearly at the rate of 4,000 feet in a minute. This great velocity was, doubtless, designed to produce some beneficial effects in the economy of nature, with which at present we are not acquainted. I come to this conclusion because I think we have sufficient grounds for believing that the Deity does nothing in vain.

"His wisdom guides the rushing winds,
Or tips the bolt with flame;
His goodness breathes in every breeze,
And warms in every beam."—DARWIN.